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Cincom gears prices to smaller user

AIMING for the lower end of the market and following IBM's strategy for the 4300 series, Cincom has announced a pricing deal designed to bring its range within the reach of the smaller user.

The change in pricing strategy is aimed initially at the 4331 user who finds himself threatened with an early upgrade in hardware, due to the CPU-hungry combination of IBM's DL/1 database and CICS control system.

Cincom is offering its alternative options Total, its widely used database, and Environ 1, the online control monitor, on what UK general manager Terry Booth calls a "pay as you go" basis.

"The DL/1 CICS combination is a heavy-duty solution which is inappropriate for the smaller user – or in fact any user – when it comes to building large integrated information systems," said Booth.

Cincom's answer to ICCF, an online program development system called LMS-II, and the database query facility T-ASK will also be available, as well as its manufacturing system MRPS. The company has committed itself to making all future software offerings available on the 4300.

"We're not reducing prices," explained Booth, "IBM seems to be marketing the 4331 almost as a mini with an upward growth path. So we've priced our products according to the structure used. It means that a user can build up his system from a small file base right up to a large system under MVS without conversion."

A small user can start with Total for £210 monthly, rising to £409 monthly for the combination of Total and Environ.

NEWS IN BRIEF

Cloud over printing kit

NEW technology at The Times has again gone into limbo, despite agreement being reached with the main print union involved, the National Graphical Association. Following the decision of the Thomson Organisation to sell Times Newspapers, management has decided to freeze further changes in order to save the large sums involved in "buying out" piece-work rates.

Some development work is continuing.

Going public

SCANDATA is going public, on November 10 on the Stock Exchange unlisted security market. The company will be placing 400,000 shares – of which 100,000 will be available at 125p a share, payable in full – through City bankers Cayzer Ltd. Brokers to the placing are William de Broe, Hill, Chaplin.

£2 million deal

DATA Recall, the Dorking-based word processor maker, has signed a deal to increase its turnover substantially by exporting £2 million worth of equipment to Spain over the next 2½ years. Spanish distributor is Percomp Informatica.

Shows clash

TWO European software shows have been announced for 1981 – and have picked the same dates. European Conference Organisers is to run shows in Paris, Munich, London and Stockholm – with the Paris venue set for June 1 to 3. But Dutch publishing company Diligentia has just announced Europe Software at Amsterdam on June 2 to 4. Both shows are aimed at an international market, say their respective organisers.

'Make PAYE job open to all'–IBM

WITH the government having to decide within the next few weeks if ICL should be the major contractor for the PAYE computer scheme, IBM has publicly warned against ICL getting the job. At the same time the Conservative Bow Group has published a lengthy paper called "The Big Steal" describing the centralised approach to the project as "a salesman's bonanza" and urging that it should be scrapped in favour of microcomputers in every tax office.

Revealing its nervousness about losing the PAYE contract, IBM went to the unusual length last week of holding a press conference to explain why the single tender policy favouring ICL, which expires at the end of the year, should not be applied.

IBM stressed that highly effective database and communications software was still vitally important despite the more cautious approach to the project recommended in the report just completed for the government by consultants Computer Sciences and Pactel as well as the Inland Revenue review team.

Recommendations in the report, which has still to be studied by the relevant ministers and discussed by the Cabinet, include shelving plans for an online national network linking all the 12 proposed regional PAYE computer centres.

But IBM argued that these links still needed to be designed into the initial software structure.

Scaled down

The report also suggests that the pilot system should be scaled down from 2,000 terminals to 500 and from two million tax payers to about 500,000.

Responding to the Bow Group's recommendations, the Inland Revenue said a distributed processing approach had been rejected mainly because of the high volume batch processing content in the proposed scheme.

The Inland Revenue pointed out that Centre 1, the system at East Kilbride in Scotland which has been processing PAYE records in batch mode for nearly 10 years, had proved highly effective for handling batch jobs like bulk printing and all processing against the full file of tax payers.

The aim now was to combine on the same system cost effective batch processing with the online access that had been under evaluation since 1977 at six PAYE offices in the North West of England.

APL for the Zilog MCZ-1

A VERSION of APL for the Zilog MCZ-1 microcomputer was launched just in time for Compec. Zilog is supplying the terminal and printer needs for APL notation; the complete system will cost about £6,000 inclusive of special peripherals but under £2,500 without them.

The micro version of the language, TIS APL, was implemented on the Z80 by its originators, Telecompute of Canada, to take advantage of the Z80's own facilities. The language takes up about 40K-bytes and has been made as close as possible to I. P. Sharp's APL and STSC's APL *Plus.

To overcome the problems of speed and efficiency encountered in micro-versions of CPU-hungry APL, the Z80 version is fully memory resident.

WPs are blacked by town hall union

LOCAL councils in Camden and Tyne and Wear have been hit by industrial action as a result of a ban by local government union NALGO on the introduction of new technology in town halls.

Word processing equipment in Camden's rates department and Tyne and Wear's architect's offices have been "blacked" by the union and will remain so until the respective branches get new technology agreements at a local level.

NALGO gave its local branches a directive to seek their own agreements on new technology after failing to secure a national agreement earlier this year.

At Camden the union branch has instructed 40 administrative and clerical staff – many of whom were upgraded last month – not to use a Wordplex word processor installed in the rates department over a year ago.

Policy

David Eggmore, local branch secretary for NALGO, commented, "We have a current policy of non-co-operation on new technology, so our members won't use the equipment until a general agreement is reached. Further talks are due to take place later this week.

"We want terms that relate to such matters as job loss, training, regrading and health and safety."

At Tyne and Wear the union is refusing to let three secretarial staff use a Bitsy word processor until the council agrees to a definition of new technology encompassing data processing systems, word processors, micros and VDUs.

The union is seeking terms under which "there shall be no compulsion for members to operate new equipment, re-training shall be provided where new skills are required, and regrading shall be agreed with the union."

Compec launch

AMONG the offerings Digital Equipment launched at Compec was a distributed realtime system for LSI 11 and PDP-11 hardware. Called DTRS 11, it is a multiprocessor operating system developed by a Dutch company and marketed in the UK by Midelectron, it is said to give a full programming and processing environment.

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Martin warns 'big boys'

PROLIFIC writer and pundit Dr James Martin launched his latest book this week with the dire warning that large organisations need to change their data planning if they are to cope with the explosive growth in computer applications.

Instancing US figures which predict a 100-fold increase in the demand for applications by the end of the decade, Martin's book "Strategic Data Planning Methodologies" is aimed at educating senior management on the need for strategic planning and in providing a methodology which is, he says, "the only strategic data planning which works."

In London for the worldwide launch of the book, Dr Martin also quoted US figures which put the cost of a single instruction line on a commercial program at $8 and, within the Pentagon, up to $85.

The use of high level query languages, power report writers, graphics and languages like Nomad and APL will provide the tools, he says, but there is a need for senior management to plan, take strategic decisions and retain tight control. IBM's Business Systems Planning recognises this, adds Dr Martin but, while encouraging senior management to take note of the importance of data planning, it does not give them a clear idea of what to do.

*Published in the UK by Savant Research Studies, 2 New Street, Carnforth, LA5 9BX. It costs $200.

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Inmos plant deadline

MEMBERS of the partnership that designed the controversial Pompidou Centre in Paris have been chosen to design Inmos' first UK factory. The semiconductor manufacturing plant will be on a 33 acre site at Duffryn, Newport, Gwent. It will be designed by Richard Rogers and Partners. The £25 million factory is due to open by summer 1982.

Although the site has been chosen, Inmos is still waiting for planning permission. The specifications to the architects are for a flexible building which can be erected quickly, is spacious and cost effective.

The resulting plans describe a long thin building with a central spine and a ceiling suspended from pylons.

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Applications for copies of the Summary of Operational Requirements should be sent to the CENTRAL COMPUTER AND TELECOMMUNICATIONS AGENCY (Cost 5A/1), Gillingham House, Upper Stable Lane, NORWICH NR3 1DW quoting the appropriate Reference No. shown above. Completed proposals must be received not later than 8 December 1980.

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Unions to resist ICL's 2,500 redundancies

MAJOR staff unions at ICL are to hold a national level meeting next Monday, November 17, to resist the closure of the ICL plant at Winsford, Cheshire, involving the loss of nearly 1,500 jobs. In all, the company announced last week some 2,500 redundancies.

Earlier this week, workers at the Winsford factory were sitting-in as a protest against the company decision. "Our initial reaction was to maximise publicity", said Pat McKenna, chairman of the joint union committee representing all workers at the plant.

He said that 1,000 other jobs had recently been lost on the Winsford industrial estate, and that the action was "social publicity" over unemployment rates in the area, now approaching 20%.

ICL's statement that it was cutting its UK workforce by about 10 per cent was made on the eve of official confirmation that it had been awarded the much-prized Inland Revenue PAYE contract.

A statement issued by ASTMS, the biggest staff union at ICL, blamed the cuts partly on the company's failure to develop "a coherent employment policy" despite being pressed to do so by the trade unions for a number of years.

ASTMS added that it would be drawing up alternative proposals within the next few weeks.

While ignoring a major point made by ICL in its statement about the increasing effect of new technology on the labour content of its products, ASTMS described as "understandable" two other reasons given by ICL for the redundancies, the strength of the pound and high interest rates. Both, ASTMS pointed out, were the result of current government policies.

According to the company's managing director, Dr Chris Wilson, the company had taken action to reduce its operating costs and there was now a need to reduce employment costs, the biggest element of fixed expenditure.

DR CHRIS WILSON . . . Employment costs are the biggest element of fixed expenditure.

Confirming suspicions that ICL's sales, especially of mainframes, have fallen significantly over the last few months, the company admitted that there had been an overall turndown in the demand for computers as a result of the economic recession.

ICL also revealed that the results for its financial year ended September 30 would reflect the impact of all the reasons given for the redundancies, particularly during the second half of the year.

Manufacture of the medium scale mainframes currently built at Winsford is to be transferred over the next year to the newer plant at Ashton-under-Lyne, near Manchester, which, according to ICL, has sufficient capacity to produce both large and medium scale mainframes from 1981 onwards.

But while 1,470 jobs will be lost from the Winsford closure only 200 people will be added to the

● Turn to page 4

Briefing

Viewdata bureaux

HAMBROS Bank, Modcomp and Telemachus of Aylesbury have formed a joint company to operate viewdata bureaux based on Telemachus' TM3 viewdata system. Its first two systems, based on Digital Equipment PDP-11s, have been installed in the new central London office.

A PDP-11/23 is to serve users of the Stock Exchange's Topic viewdata service, and a PDP-11/34 will serve other users. The TM3 system is being rewritten to run on Modcomp Classics, on which further bureaux will run. Viewdata International is the preferred name for the company, but it may call itself Videotext International if Companies House objects.

Bunzl buyer

THE bureau side of Bunzl Data Systems, which parent company Bunzl Pulp and Paper has been trying to sell since it decided to drop out of the computer business two months ago, has found a buyer. It is Rolfe and Nolan, the City of London based firm that runs commodity broking services on two Digital Equipment PDP-11/70s bought from BDS when it was still in the systems business.

Ring first

FIRST commercial implementation of the Cambridge Ring local networking system has been delivered to Imperial Chemical Industries' headquarters in Runcorn, Cheshire, by Orbis Computer, a Cambridge-based two-man company set up just over a year ago to supply local networks.

Apple goes public

MICROCOMPUTER manufacturer Apple Computer is going public in the US. The firm has filed an application with the Securities and Exchange Commission for an offering of 4.5 million shares and trading is expected to start next month. The issue price could be as high as $17 million, valuing Apple at $825 million.

2900 UPDATE

ICL'S long-awaited new model in the 2900 range, code-named S3, is announced today (Thursday), as the medium-scale 2955 and the larger 2966. A new operating system, Concurrent Machine Environment, is also being launched.

It will allow the native 2900 operating systems VME/B or VME/K to run at the same time as DME, which handles 1900 series programs.

Nexos into small business systems

OFFICE systems firm Nexos has entered the small business systems market by taking on the marketing of Systime's 8086-based microcomputer (CW, March 27).

Calling it the 4500, Nexos is marketing the equipment with a selection of Systime's applications software for invoicing, stock control, payroll and ledgers.

The announced price of £7,500 is £1,500 more than the price expected in March; for this the buyer gets a CPU with 192K-bytes of memory, twin floppy discs giving 2 megabytes of storage, a single VDU, and a matrix printer. Nexos is marketing and maintaining the 4500 with its existing sales and engineering forces.

Systime has been developing the model 500, as it was known internally, for some time, under a Department of Industry grant.

US firm attacks Texas' systems market in UK

AN ATTACK on Texas Instruments' UK systems market is under way from one of its OEM distributors in the US, Daxko, which plans to import TI systems into Europe via a new base in Ireland.

The company claims that it will be able to ship the products to Europe and offer them at 40% under TI list prices, with delivery dates of between 21-45 days.

Daxko claims that by advanced ordering in the US it is able to meet a demand which TI itself has been unable to satisfy. TI is currently quoting a maximum delivery time out of the US of 90 days, but this includes a full system test at Bedford.

Daxko has built up a stock of TI products in the US which it plans to fly into a plant in Dundalk, Eire. It will give them added value by doing some assembly work, and then sell them to the UK and the rest of Europe.

Good terms

Nicholas Ashton, head of European operations, says that the company is also prepared to sell to other OEMs with minimal value being added in Ireland. But, he says, the company is anxious to remain on good terms with TI.

This is Ashton's second attempt to outdo TI: the first involved a bid for MicroFocus CIS-Cobol for TI systems in the UK (CW, July 31).

Ashton, then sales director for Cinsal Computers, an OEM distributor for TI based in Norfolk, bid for sole UK distributorship of CIS-Cobol on TI systems. Negotiations are still going on.

The go-ahead for the Dundalk plant came on October 16 in an agreement with the Irish Development Authority, says Ashton.

He claims the plant has already taken $0.75 million of business since then. Daxko expects to sell over $10 million of TI-based pro-

●Turn to back page

'Quality of visitors best yet at Compec'

NEVER mind the width . . . feel the quality. Compec closed last Thursday with exhibitors well pleased with the quality of visitor attracted to Olympia over the three days.

"We have been impressed by the volume and high calibre of visitors to our stand," said Hewlett Packard. "This time the quality of visitors is the best we have ever had at Compec," added Real Time Developments.

The total attendance over the three days came to 22,786 – down on last year because the £2 price tag for visitors cut out the schools' parties and general non-industry visitors. Last year numbers grew so large that Olympia was being described as one large rugby scrum.

A popular feature of the show was the computerised job-finder and product information service run by Computer Weekly. The figures showed that the highest number of users of the job service were systems analysts and programmers with those having over five years' working experience as the largest proportion.

The continued popularity of a central London location was shown in the level of visitors from the South East. About 70% came from this region.

Reflecting the exhibitors' reactions, the breakdown on visitor job title showed that about 25 per cent were directors, or DP managers.

Software copyright test case settled out of court

WHAT looked like an interesting test case for the nebulous software copyright law has been settled out of court. Kansas City Systems and Anthony Harding of Molimerx have come to an agreement, after Harding and associates, including distributors Microsoft, served an injunction on Kansas to prevent it marketing Level IV Basic. It was alleged that Level IV Basic used part of Microsoft's Level III and a monitor, marketed by Harding. A spokesman for Kansas said the two programs had been obtained from the GRT Corp of California, in the belief that the purchase was legitimate.

Kansas has agreed to stop marketing the programs and pay half of Harding's costs, about £2,000. No other damages or compensations were involved.

Feelings run high about the case, and the settlement appears to be far from amicable. Tom Crossley, manager of Kansas, believes that it was an exercise to try and get his company out of business.

Anthony Harding denies that he has "anything personal" against Crossley, and believes he had never even spoken to him. "We had to sue him, but he made us do it," he said. "If he would only publish his own programs I'm sure no one would have anything against him or his business."

The case is significant in that Justice Graham granted the injunction against Kansas and the relevant evidence was confiscated, on the grounds that software copyright was infringed.

Airline order

BRITISH AIRWAYS, which has chalked up many sales overseas with its own software packages, has gone to the Italian State airline, Alitalia, for a cargo routeing and control system. Called Fast, it has already been adopted by several other IBM-based airlines.

APL users meet

"NEW directions in APL" is the subject for the next APL user group meeting at the Sherfield Building, Imperial College, Exhibition Road, London, at noon on Friday, November 21.

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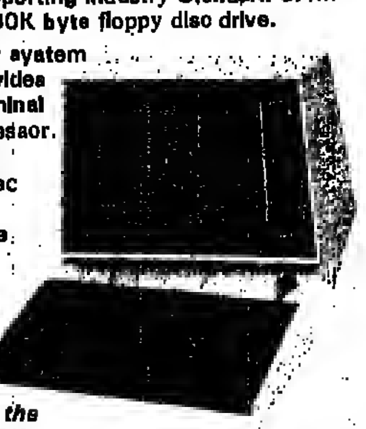

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Northern Area Sales
Newtown House, Maid Marion Way, Nottingham.
Tel: Nottingham (0602) 410561

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Editor
Simon Timm 01-661 3122

Deputy Editor
Brendon Gamester 01-661 3124

Advertisement Manager
Harry Hutson 01-661 3101
01-661 3102

Class Ad Manager
Brian Dorrant 01-661 3106

Publishing Director
Dr J. A. G. Thomas

Editorial Director
Chris Hipwell

IPC Electrical Electronic Press Ltd, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telex: 892084 BISPRS G

Branch Offices:
Birmingham: Lynton House, 7/12 Walsall Road, Birmingham B42 1BA. Telephone 021-356 4838.

Manchester: Grove House, Skerton Road, Old Trafford, Manchester M16 0WL. Telephone. 061-872 8861.

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EDITORIAL
The following editorial staff can be contacted on 01-661 3500, with the extensions shown:

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Claire Gooding	3541
Rory Johnston	3634
Eileen Steiner	3540
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COMPUTERVIEW

ICL joins roll call

ICL managing director Dr Chris Wilson has made no secret of his belief that ICL will soon be almost wholly a software company, with hardware manufacturing representing a relatively small proportion of its total effort. Anyone familiar with the advances being made in circuit integration would no doubt agree. The same trend is affecting every computer supplier.

Nevertheless the general public, conditioned to believing that the computer industry is expanding relentlessly, must have been shocked to see ICL included in last week's roll call of companies adding their names to the sad list of firms hit by the recession.

The size of the ICL cuts, 2,500 in all, resulted in some of the widest coverage in the media ever experienced by the company, unhappily far more extensive than for most of ICL's positive achievements.

About 1,700 of the 2,500 jobs lost will be in direct manufacturing, the bulk from the closure of the Winsford plant, but ICL itself listed many more reasons for the cuts than simply the introduction of new technology. The company admitted that its sales had been hit by uncompetitive sterling exchange rates and by the recession, and hinted strongly that its financial results for the year ended September 30 would be a disappointment.

But the financial results for the current financial year could be disastrous without the planned reductions, one ASTMS official within the company having described them as "very regrettable, but inevitable".

The announced reduction of 400 in marketing services, nearly half the total in that sector, and the staff cuts in Baric and Dataskil, indicate that the company is still overstaffed

As controllers of a highly unionised company, ICL management cannot have made the redundancy decision very easily. But they were no doubt spurred on by the reasonable fear that overmanning of the kind suffered by ICL around the turn of the Seventies could prove fatal in today's severe economic climate.

The initial reaction of the Stock Market to the staff cuts was distinctly negative, although to a large extent the result of disillusionment among the more naive type of speculator. More sophisticated investors may have taken note of ICL's statement to the effect that it was retaining its investment in research and development in order to take advantage of any improvement in business.

At the same time they would be right to view with some suspicion ICL's drastic cutback in its intake of university graduates earlier this year, a move which undoubtedly damaged the company's reputation badly among the sort of people with the brains and talent to ensure the company's long term survival.

Sad loss

THE accounts of the only financing organisation to have a stand at Compec, show a loss to UK entrepreneurs and inventors of over £4,000,000 for last year. This is the sad reality behind the corporation tax paid to the government by the National Research and Development Corp.

The corporation was set up in 1949 to provide funds for individuals and ... with commercially exploitable ... inventions which might not otherwise receive funding. Among the better ... projects sponsored or assisted by the corporation was ICL's 1900 series ... Newbrain microcomputer and the ... aided design company Genysis.

So successful has the Corporation ... over the years that it generated ... over £19,000,000 last year, from ... and fees arising from the 16,000 ... patents it now holds or has an interest ...

However, despite investing ... £8,000,000 in various ideas, ... inventions and companies there was ... profit of about £8,000,000 on which ... poration tax of £4,000,000 was levied ... corporation is not a charity but is ... required to break even, and on that ... there is a growing shortfall of good ... ideas reaching the NRDC.

Despite recent advertisements in ... of daily and Sunday newspapers ... little evidence that this year will be ... better than last year. The NRDC will ... a factor in the government's borrowing ... quirement, rather the reverse, and the ... puter industry itself will be the poorer ...

LETTERS to the EDITOR

An open letter to President Brezhnev

A GROUP of internationally known and influential computer technology specialists, including Daniel McCracken, President of the Association of Computing Machinery, wish to register our deep concern at the plight of Mr Haim Kilov of Karl Marx Str, 75-13 Riga 11, USSR.

We have known him professionally for some years. On the one hand he is experiencing some difficulty, it seems, in receiving professional literature such as is sent by the ACM and by myself. On the other hand we know that he has repeatedly been turned down by the Office of Internal Security in his request to leave the country.

Both President McCracken, in his president's letter in the widely-read Communications of the ACM, and I in my column in Computer Weekly, have made the facts about Haim Kilov known to a wide public. We intend to keep up our efforts and to increase active support among computer professionals.

TOM GILB
Kolbotn,
Norway

PS. Readers who would like to support Haim by corresponding or sending him professional literature will, I am sure, be most welcome. Those who would like to protest about his lack of a visa would be especially appreciated. In keeping with Donald Michie's advice earlier in CW, the tone should not be threatening. It is enough to take the trouble to register your interest.

Maturity beats youth

I HAVE been following with interest your recent correspondence regarding the reluctance of companies to employ mature TOPS graduates. Naturally there are problems, such as the need for a reasonable salary, the requirement for instant productivity, the mixing of the young with the old and so on, but personally I believe the scales weigh in favour of this type of person.

My 22 years in the computer industry, both in North America and in the UK, mostly at managerial level but including three years' teaching programming and systems, have brought me into contact with persons of all ages and degrees of academic qualification.

As in many other endeavours, there are areas where the young and/or highly qualified individual is needed, but to suggest that the average job in computing requires some unique qualities other than the desire to succeed, common sense and the ability to think logically is questionable.

If one has the desire and has common sense, the means to acquire the knowledge can be obtained. I have personally employed people of all ages and varying backgrounds, including in one instance the teaching of horse riding and in another the managing of a farm in Rhodesia. In my experience the mature and quite often the less qualified person has invariably turned out to be the more reliable and overall, the better employee. He may in some circumstances be slower than the young whiz kid but I have found to my cost that speed, particularly when it involves the "instant", solution creates more problems than it solves.

I realise, of course, that these views are controversial and obviously it would be foolish to generalise. I am also aware that an academic could probably prove that I am wrong. However, I would like to think that my own organisation with some 20 computers installed gives some credence to these beliefs.

I am also prepared to back up my views and would be pleased to hear via the editor from any mature TOPS graduate. We have a vacancy for a junior programmer-/analyst to assist in maintaining our ICL 2903s and in installing the first of many ICL ME29s.

M. H. SALMON,
Head of Computer Systems
Booker Belmont Wholesale
Edenbridge, Kent.

Unfair to PCMs

YOUR reporting (Focus, October 28) of the recent Institute of Data Processing Management meeting on vendor independent customer engineering made assumptions which, if correct, should definitely require DPMs to re-assess their attitudes. I take heart in the knowledge that your comments could not refer to most IBM plug-compatible manufacturers' engineering services.

These PCM companies exist by always offering the service and flexibility to which Data Processing Customer Engineering claims sole rights.

PCM engineers install equipment at any time convenient to the customer. Furthermore, PCM engineers are required to install and debug before handing over normal maintenance to DPCE–which must make us even more practical.

You are, however, correct when you state that third party services operate to the same time-scales as manufacturers. They have to when they are using manufacturers' resources.

D. CONNACHER
UK FE. Manager
National Advanced Systems
Hounslow, Middx.

Proto-Pascal quote

I WAS fascinated to see the tail-piece of Mr Brazier's letter (CW, October 23). Is this Pascal, of which I've read so much? I feel sure it has the makings of a revolutionary new language. Perhaps next week you could publish an implementation of the same code in Cobol (or even English?).

SIMON GOODE
Royal Radar
Newtown, Tewkesbury

P.S. Apologies for old-fashioned ... Je ne parle pas Pascal Français (sic).

1984 and all that . . .

THIS week's examples of the strange things people say in the media about computers were sent in by Margaret Kirby of London N19 and John Grant, of Cambridge, who each win £5.

In 1982, all the trunk exchanges and one-sixth of the local centres should use the System X principles. The rate of installation will increase rapidly after 1983: over the next three years, only 14 new exchanges are planned. The network will be fully converted late next century.

But whereas, in the past, computers have had to convert their digital output to analogue form to use a network intended for humans, in the 1990s people will have to transform the signals that convey their conversations – from the smooth "ups" and "downs" of the natural, analogue, world – to streams of binary blips. This is to meet the requirements of a network run by computers and, to a large extent, for computers: nothing illustrates better the degree of these machines' impact.

New Scientist

Modata
OVERPRICED COMPUTERS
INADEQUATE PERSONAL MICROS ?

B4, 61A moves to F3, 115

WE'VE MOVED

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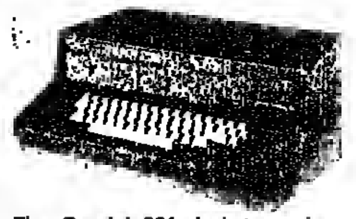
It's all systems go for micros at Compec

THIS year's Compec saw the launch of several new microcomputers and microprocessor-based systems, including at least two UK systems. Comart, the UK Cromemco distributor, launched its first system in a move to satisfy the demand for UK products. The new company set up by John Marshall, the ex-managing director of Nascom, and called Gemini Microcomputers, also launched its first system.



The Gemini 801 desk top micro, launched at Compec.

Comart's system, the CP100 communicator, is a Z80-based communications oriented microcomputer which runs CP/M and is S100 compatible. It is selling for £2,295 (excluding VAT). Marketing manager, John Lamb, indicated that it is the first of a generation of products developed by Comart.

The systems are being assembled at the company's headquarters in St Neots, Cambridgeshire at an initial rate of 20 per month. Eventually production will reach 100 per month at the 10,000 sq ft premises, according to Lamb.

On the memory side, the communicator has 64K bytes of RAM which can be expanded, and two 5-inch floppy disc drives each with 390K bytes. It has been designed with a view to future extension to 8-inch and hard discs, and can accept up to four disc drives.

The power supply conforms to Post Office regulations, to support future use with Prestel, viewdata and Datel communication systems. Lamb told Computer Weekly that the company is part way through obtaining Post Office approval for viewdata.

Other modes of communication will be synchronous and asynchronous. Two serial interfaces and one printer interface are accessible on the system. Comart plans for the future include MP/M and CP/NET for the CP100.

On the support side Comart will be supplying an on-site maintenance service, supported by repair and test facilities at the headquarters. The Computerland Byteshop and Comart dealers will be supplying standard end-user application and software support.

Gemini Microcomputers, based in Amersham, launched the Gemini range of three systems, the 801, the 801A and the 801B. The systems are all Z80-based desk top microcomputers, which run the Digital Research operating system CP/M.

For £1,075 plus VAT, the 801 basic system has 64K of RAM and two 5-inch double-density, double-sided floppy discs offering 630K bytes of online storage. It can run an 80 or 40 column screen, and has an Ascii keyboard, an RS232 interface and an optional parallel interface.

One interesting feature is that the character set is held in RAM and can therefore be programmed to suit the user. For example, the 801 could act as a low-cost terminal for an APL system. It also comes with a CRTC chip giving the system a good graphics capability.

Systems 801A and 801B cost £695 plus VAT and £575 plus VAT respectively. They are both simpler versions of the 801 with less storage capability.

According to the company's founder John Marshall, the systems will be available in January of next year. An S100 bus interface is planned for early next year and users will also be able to implement the Nasbus expansion.

The 801A and the 801B both use cassette storage instead of the floppy disc, and the latter does not include the enclosure. Neither systems run CP/M, but have 8K Basic included.

John Marshall told Computer Weekly that the 801 system specification was formulated from the interest shown by potential Nascom users. It was in fact designed by ex-Nascom engineers who formed a design consultancy company, Specialist Micro Design, after Nascom went into receivership earlier this year. SMD is headed by the ex-marketing director of Nascom, Kerr Borland who now runs a marketing company, Product Launch.

Meanwhile the new Nascom, under the directorship of Peter Matthews, also had a stand at the exhibition. Matthews recently bought up the assets of Nascom with "private funding" and placed them in to his other company, Allteck Technology Initiative, while the formation of Nascom International gets under way.

1,000 systems for one firm

QUALITY Business Machines took their cheque book to Compec last week and within hours of the exhibition opening had splashed out £700,000 on 1,000 microcomputer systems from NewBrain Laboratories.

A microcomputer applications company based in Brighton, the company will add its own stock control, financial and accounting packages to the systems and sell them, through franchise, for prices ranging from £600 to £2,000, depending on configuration.

First agency to go on show

ON foreign soil among the hundreds of manufacturers and suppliers showing their wares at Compec last week was the stand of Effectia Gravis, the London-based contract and permanent staff agency.

The agency was running competitions and giving away gifts in addition to helping fight the recession by dealing with the more serious business of adding more operators, programmers and analysts to its books.

"We're the first agency to take a stand at Compec," said Effectia Gravis marketing manager, Mike White. "Other agencies said they were going to take stands but in the end we were the only ones to do it."

White agreed that the staff agency is "tight", but pointed out that the only way to fight the economic situation was to take the positive approach and show "guts".

Emulators for Naked Mini 4 users

FOR OEM users who need to transfer data between Naked Mini 4 computers to host systems of other manufacturers, Computer Automation has introduced IBM 2770/2780/3780 emulators.

The new protocols will allow software applications to be developed under the OS 4 operating system using NM4 Assembler, NM4 Fortran or the recently announced NM4 Coral 66 and NM4 BCPL. Users will also be able to access a central computer system from remote locations from RJE terminals.

Computer Automation has been giving a lot of attention to software lately. As well as the NM4 BCPL and NM4 Coral 66, the company has released a version of Pascal. All three languages are described as "software and documentation packages" for the Naked Mini 4.

The NM4 Pascal is a superset of the proposed ISO draft specification for Pascal. The compiler operates under the OS 4 operating system on any Naked Mini 4, and generates directly executable code to run under OS 4 and RTX4.

Extension support includes support for separate compilations, real time programming and task synchronisation, compile time facilities, and code and data sharing among separately compiled programs.

The BCPL implementation is derived from the Cambridge developed language which is a powerful high-level language for systems development and implementation. The CA version is kept as close as possible to its origins to avoid conversion problems.

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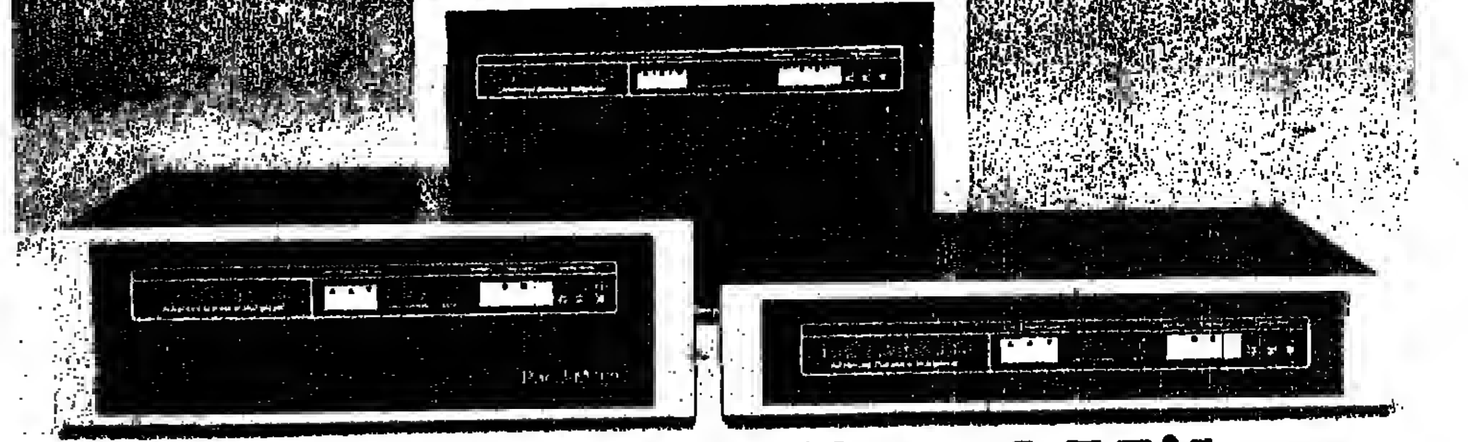

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Downtime

by Chad

The system that distributes itself

IS the charming lunacy of our business fading away? Compec this year seemed positively tame in the gimmicks that were being flashed about. No kangaroos, no birds dressed up as birds . . . err, girls dressed up as birds. John McNulty's team on the usually bizarre Modular Technology stand were doing some flashing with their new laser communications link, but their get-up was almost ordinary, apart from the roller skates.

Delta Data Systems did have an interesting variation on the customised terminal. I understand it runs on pure benzene, and goes from 0 to 10MHz in 4.5 seconds flat, in third gear.

Information retrieval is simple. It just drives down to where the information is, retrieves it, and drives back.

With it you can build the only distributed data processing system that distributes itself.

There was something touching about the biggest company there having one of the smallest stands. IBM was showing its new super-cheap terminal. No Indian squaws draped over the screen or anything like that.

I DIDN'T see any ladies swinging from terminals on the ceiling at Compec. But my picture is not a joke. It seems there is a Customs and Excise multi-part form that falls apart when you try feeding it top first into a printer. To solve this problem, the boffins at Mannesmann Tally have modified their printer so that it can run upside down.

A micro-controlled President Reagan?

TRY as one may, it's hard to come up with a computer angle on Ronald Reagan's victory. It may be that Jimmy Carter was hurt by the allegations over his systems designer son's business dealings in the Philippines, but I don't remember Reagan bringing it up on the TV debate.

In fact, there wasn't much slanging between them on the inadequacies of their policies for information technology, was there?

"What do you plan to do about our microelectronic future, Mr Reagan?"

"Our micro what?"

"Will you call off the Justice Department's pursuit of IBM?"

"I believe in the pursuit of happiness."

"And the New World Information Order? How do you feel about cultural aggression?"

"Well, I come from the culture centre of the world, Hollywood."

"That's exactly the problem, Mr Reagan . . ."

Both candidates issued statements on privacy, saying it was a good thing, but not saying what they would do about it. Perhaps they are tacitly admitting that they don't understand it. That would be a rare piece of honesty.

I can reveal one tightly-kept secret now, anyway. Reagan died several years ago and was replaced by the microprocessor-controlled rubber model of him from Disneyland. There's a faulty solder connection on one of the chips, and that's what causes his speech to falter from time to time.

With luck there's a fault in his button-pushing finger as well.

MICHIE'S PRIVATEVIEW

Who killed the desert traveller?

ONE of the new application areas for rule-based computer models is the giving of expert legal advice. This domain shares an attractive feature with chess: much prior formalisation and codification is already available in the form of numerous weighty manuals. At the Rand Corp, Santa Monica, Don Waterman is using his advice language ROSIE to implement a system knowledgeable about the legal liability of manufacturers whose products inflict damage on users. The system must readjust its views flexibly in response to changes in the law.

A case recently put to ROSIE concerned a householder who was cleaning a bath-tub drain with a cleaning fluid. The latter exploded out of the drain causing severe burns and permanent scarring to his left arm. A change in law had excluded strict liability if the product could be shown to be not unreasonably dangerous. The resulting assessment of damages at $0.00 may seem to affront natural justice, but at least questions of causation did not arise in explicit form. This might have happened if, for example, the plaintiff had previously poured some other substance down the drain liable to ignite on contact with cleaning fluid.

Conundrum

Most people believe that they understand causation perfectly well. When challenged, some will say that causation can be handled just like implication, which we certainly can mechanise. Actually it is not like that at all.

First. A corollary of "A implies B" is *if* not-B *then* not-A, but a corollary of "A causes B" is *if* not-A *then* not-B.

Second. In contrast to implication, the accepted basis of causation is probabilistic.

Third. In the probabilistic model, transitivity does not hold. By contrast, if A implies B, and B implies C, then A implies C.

Fourth. No-one objects if a chain of implication forms a loop. Looping of causation statements is frowned upon.

The causality conundrum which I have always treasured concerns a traveller dismounting from a trans-desert bus to complete his journey on foot. This man had two enemies, each bent on causing his death. The first had surreptitiously put cyanide into the traveller's water-bottle while still on the bus. The second, not knowing this, stalked the traveller for many hours before he found a chance to pierce the bottle with a well-aimed rifle bullet. The bottle's contents leaked entirely away, and the traveller died a lingering death from thirst.

Perplexed

Both men were in due course arraigned, and both were found guilty of attempted murder. On the charge of murder, however, the court found itself in perplexity.

Enemy No. 1 pointed out that all possible consequences of his action had been nullified by the escape of the bottle's contents.

Enemy No. 2 pointed out that his action, far from causing death, had prolonged his intended victim's life.

The court eventually felt obliged in logic to accept both the above arguments. But at the request of the jury a rider was entered to the effect that there seemed to be something wrong somewhere.

The Stanford logician Pat Suppes is the author of a computer-aided instruction project which has been bringing literacy to forgotten parts of the American South. Recently he has been thinking about the logic of causality. As Suppes' formalism took shape on the blackboard, my mind went back to the Saharan brain-teaser. Was this the juridical weapon which that sorely tried court had lacked? Let us try it out (I shall simplify somewhat).

Professor Donald Michie is head of the Machine Intelligence Research Unit at Edinburgh University.

We start with the idea that A is a *prima facie* cause of B if and only if (1) A precedes B in time. (2) A has a non-zero probability of occurrence. (3) B's probability *given that A has occurred* is greater than B's probability otherwise.

Note that so far this is only *prima facie* causation, according to which, for example, a fall in the barometer reading is a cause of rain (*prima facie* it is). We now get rid of such spurious causes by finding some event C, earlier in time than A, such that (4) B's probability *given C and A* is equal to B's probability *given just C*.

In the barometer example, C could be lowered atmospheric pressure (as opposed to barometric reading, which is B).

Back to the desert court-room, Suppes-style. Enemy No. 1, it seems, takes the rap. Enemy No. 2 is acquitted of murder. Is this justice? Hard to say. But No. 1's deliberate action certainly doomed his victim to die, which cannot be said of number 2's. To that extent at least the Suppes calculus seems to give a fairer result than the court's troubled verdict in the story.

Donald Michie

FOCUS

Putting the case for Eurocomputing

EVERYONE present at last month's EEC/NCC Telematics Conference appeared only too keen to encourage State – both national and international – assistance and intervention in the computer industry.

Perhaps this attitude was to be expected given that the delegates represented the UK computer industry rather than a UK computer installation. Many DPMs, far from backing the State subsidy line, would hold the view that boundaries in computing do not exist. Whether their IBM kit was developed in Texas, built in Taiwan, assembled in Troon, with software added in Tunbridge Wells, as long as it was cost/performance competitive and had the correct voltage cycles, the contract would be signed.

U-turn

Hardly has the government implemented the "smaller is better" doctrine and clipped the Post Office down to separate sizes, than they are being urged to make a technological U-turn. Viscount Etienne Davignon, Community commissioner for industry and Christopher Layton, EEC director of high technology, made impassioned pleas for more State interference and control. Otherwise, they hinted, the Americans and the Japanese would run high technology rings round Europe.

Possibly unknown to the EEC delegation, many observers believe that the International technological world has already arrived. Many homes already have their collection of Japanese hi-fis, TVs, foreign cars, cameras and watches. A similar situation exists in computing. German disc media, French terminals, Italian minis, American printers and Putney mainframes all happily cohabit the DP installation.

The noble Viscount was keen to berate European industry for being too slow in taking advantage of the telecommunication and information revolution. But there were, admitted, many problems to overcome.

Barriers

A notable problem, it would seem to many DP professionals, is that there is already too much government. Co-operation between European PTTs, for instance, is far from harmonious. Barriers are higher than those between rival DP sales teams or the user and DP departments. The PTTs are notorious for withholding type agreements, providing add-on services and being generally unco-operative. If the EEC boot can stimulate some PTT drive and enthusiasm, great. If not, then they might just as well pack their diplomatic bags and return home.

The EEC would like to see harmonisation between all member states. So too would the DP industry, especially in such areas as privacy and data transmission. Layton suggested that telecommunications were the railways of the electronic age. Unfortunately, harmonisation buffers would stop the train, short of Dover, or Calais, if not at the International Communications Network junction.

That Europe should take concerted action against the massed ranks of American and Japanese invaders is obviously desirable. Equally, obviously, it is unobtainable.

TEN YEARS AGO

From Computer Weekly of November 12, 1970.

UNIVAC took steps to safeguard its position as a supplier of advanced computing systems with the introduction of the Univac 1110 into the market for large computers . . . . An "all-out bid by Rank Xerox Data Systems for a larger share of the online commercial market" is the company's description of its new Sigma 9 computer . . . . The largest Honeywell computer in the UK, a 512K H4200, valued at about £1 million, is being installed at the SE Gas Board's Croydon headquarters. Latest product from IBM, and their lowest-priced computer so far, is the new all-monolithic circuit System 7, designed for measurement, analysis and control of industrial and laboratory processes . . . . The Bank of England has ordered two bar-code reader/sorters controlled by a single logic unit from Recognition Equipment, to aid the identification of flawed bank-notes at the printing stage . . . . A project to investigate computer-based menu planning of school meals is being set up by Essex County and Sheffield Polytechnic with Honeywell's help.

ICL sheds 2,500 jobs

● From front page

current Ashton payroll of 800 to handle the workload transferred from Winsford.

Doubt was cast on the future of the Winsford plant earlier this year when ICL admitted that 400 redundancies were to be made there.

Also hit hard by the cuts just announced is the ICL marketing division where 400 jobs are to be axed on the services side, mainly at Letchworth and Slough.

The cuts also include 100 at ICL's Putney headquarters and another 300 in manufacturing at various locations around the country.

In its statement on the redundancies ASTMS mentioned the PAYE contract, saying how the unions had successfully campaigned to get the contract awarded to ICL.

The decision in favour of ICL is understood to have been made at Cabinet meeting last week and was encouraged almost certainly by the recommendations of the consultants brought in to re-examine the project that a less ambitious approach to the project should be adopted (CW, November 6).

But the government's favourable decision on PAYE did not stop ASTMS blaming "government dogma" as well as "the management's lack of foresight" for the ICL redundancies.

Italy leads with IBM distributed processing

IBM users in Italy are leading the way in the adoption of distributed processing with the UK-built 8100 system in at least two major application areas.

The Instituto Nazionale Previdenze Sociale, INPS, (equivalent to Britain's Department of Health and Social Security) is installing nearly 300 IBM 8100 machines throughout Italy. This is more than any IBM user in the UK has in its plans, let alone on order.

Meanwhile, the State airline, Alitalia, is pioneering the use of the 8100 for distributed revenue accounting at locations all over the world.

In both cases the 8100s will be supported by IBM's Systems Network Architecture so that overall systems management and development will stay in the hands of the mainframe site.

Way ahead

INPS is already way ahead of ICL user DHSS in the adoption of local interactive processing, having opted for IBM's first SNA supported distributed processing system, the 3790, four years ago.

A formidable line-up of 270 of the systems, with a total of over 3,000 terminals were installed at the 130 INPS offices throughout Italy for handling data entry, local database inquiry and update, response to customer inquiries, printing for local customers and office administration.

Benefit can now be drawn from any office anywhere in Italy by any of the 35 million individuals on the INPS database in Rome. The central site, where hardware includes a 3033 MP system, handles inquiries that cannot be serviced locally. It also maintains historical records, cross validates transactions and generates statistics.

Each local office is equipped with two 3790s, one for handling social security contributions from employers and the other for processing payments to pensioners and other claimants.

The 3790s, most of which have been in operation now for three years, were all leased and are now being replaced by 8100s. The newer IBM machine effectively supersedes the 3790 and offers attractions like more power, bigger disc storage and the 3775 video terminal with its advanced features like eight screen partitions.

About 130 of the 8100s are already in full operation and all the 3790s should be phased out by next year.

Alitalia is one of the leaders among IBM-based airlines in developing software systems for new applications and its latest major project is Pracsys, Passenger Revenue Accounting System. It will unload jobs like sales and agent management, billing and credit control and some ticket voucher reconciliation from the airline's central system in Rome.

By 1983 there will be 16 sites with the 8100 worldwide – four each in Italy, the remainder of Europe, the US and the Far East.

Support

Each machine will support between 20 and 50 terminals and will replace about 15% of the 200 concentrators all over the world that link IBM 3270 type interactive terminals into the Alitalia network. But the 8100s are all being installed at major locations so they will end up handling about 70% of the traffic.

The airline has estimated that it will save $35 million over a six-year period using Pracsys, partly through cutting down on line usage but mainly through estimating the staff required in Rome at the moment to capture data from ticket vouchers that pour into the Alitalia computer centre from its offices all over the world.

With Pracsys on the 8100s all ticket voucher data will be captured locally and will not be transmitted to the Rome centre at all unless there are complications like flight changes.

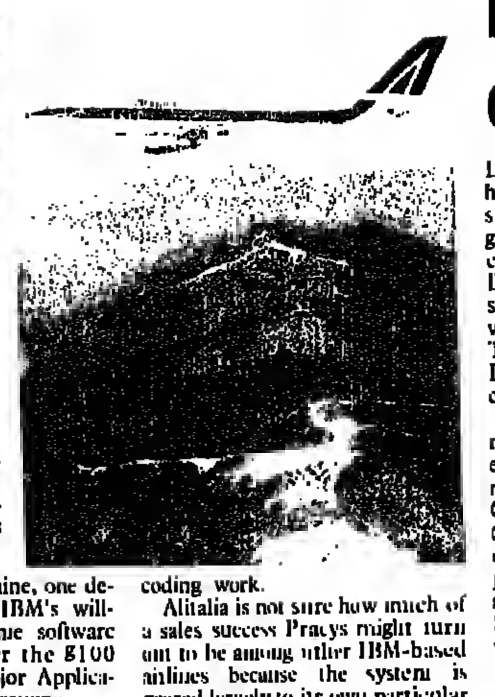
Alitalia considered alternative systems to the 8100 before opting to buy the IBM machine, one deciding factor being IBM's willingness to make some software modifications after the 8100 launch under its Major Applications Extension Programme.

But the airline is not happy about the lack of PL/I on the 8100, mainly because most of its mainframe applications development is PL/I based these days.

Alitalia staff have already managed to produce 10,000 lines of Cobol for Pracsys, but the airline is currently talking to other carriers about the possibility of sharing the coding work.

Alitalia is not sure how much of a sales success Pracsys might turn out to be among other IBM-based airlines because the system is geared largely to its own particular accounting requirements. But the airline hopes to sell the heart of the system which is said to have more general applicability.

The whole Pracsys project is scheduled for completion in mid-1983, by which time it will have cost Alitalia a total of $20 million, including the 8100 hardware and all development work.



Italy's national airline, Alitalia is pioneering the use of the 8100 for distributed revenue accounting at locations all over the world.

DMS to be used

IN their development of systems on the IBM 8100 both INPS and Alitalia intend to make some use of DMS, Development Management System. The production version which optimises code for live execution is scheduled for shipment by the end of this year.

Facilities provided by DMS include the capability to develop and test complete applications programs interactively, including map definition, data definition, field and data editing and application logic development.

In live execution programs can communicate with CICS/VS and IMS/VS on a host mainframe.

Midlectron evaluates Dutch office network

TERMINAL and system supplier Midlectron of Belper, near Derby, is evaluating a Dutch office networking system it may market, which is designed to enable programmable terminals that use the Digital Equipment LSI-11 processor to exchange files and share hard disc storage.

The system is based on DRTS-11, a modified version of Digital's RT-11 real time operating system implemented by Westvries Systems of Heemskerk, Holland. It supports Westvries' Qnector direct memory access communications board which plugs into the Q-bus on the LSI-11.

Qnectors use 40-way ribbon cable, and communicate over 25 metres at 100K 16-bit words a second in blocks of up to 32K words. Each one has a bootstrap ROM which automatically loads the RT-11 operating system into the terminal from the central filestore when it is switched on, while the main processor controlling the filestore, printers and other shared peripherals runs the DRTS-11 version which enables it to service requests from user terminals.

The boards, cables and software for a main processor and three user terminals would probably cost about £7,500 and the system is likely to be marketed by Office Computer Techniques of Leicester.

This is one of three experimental companies set up by Midlectron.

Takeover

US telecommunications company Micom has acquired Borer Electronics, a UK data modems company, and created a joint venture company Micom-Borer, which will be based in Reading. The subsidiary will operate under existing Borer management.

Rival for DEC disc subsystems

DIGITAL EQUIPMENT users having trouble getting a disc subsystem from DEC itself could give System Industries Europe a call. The independent supplier of DEC plug compatible disc subsystems has introduced a service called Site, System Industries Trade and Exchange, offering DEC kit that it has taken out of customer sites all over Europe.

Woking-based System Industries Europe has also announced expansion plans, following the $5 million share issue in the US by its California-based parent company (CW, September 11). Apart from expanding its work-force it is pressing on with the development at Woking of products for sale by System Industries and its agents world-wide.

Once of the new products, the 9800 disc system, is said to be unique. It comprises a standard 80-megabyte CDC 9762 storage module drive into which a 165-megabyte 14-inch Winchester drive built by Fujitsu has been embedded.

The package offers 137 megabytes of fixed and 67 megabytes of exchangeable storage, and System Industries points out that it provides the capacity of three RM02/RM03 drives. The Winchester unit is divided into two logical RM02/RM03 units on one drive and operates totally independently of the CDC 9762 to the extent of having a separate power unit.

Relational DBMS for HP kit

A RELATIONAL database management system for the Hewlett-Packard 3000 series has been launched by Computer Resources in California. Its data structure is said to be represented by a simple two-dimensional table rather than by the conventional, more complex structure.

Called Relate 3000, it is aimed at users who need a database but cannot afford the high costs involved in a standard database (complex data analysis, training, and sometimes extra memory).

Licensing fee for Relate 3000 is $10,000.

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PROGRAMMERS' PAGE

by Pamela Rowe

Do code-cutters still have a role to play?

A DISCUSSION entitled Qualified Programmers – Where to Get Them was bound to attract a large audience at the IFIP conference especially with a panel of controversial and witty commentators like Heinz Zemanek, Wlsd Turski and Herb Grosch.

The large audience duly turned up – though, as someone on the way to the talk said, it was debatable whether they were all looking for programmers, or simply attending one of the few sessions they thought they would understand!

There was plenty of scope for clever remarks and quite a few valuable ideas, but a good deal of re-tracing of old ground and a general lack of shape to the discussion.

To begin with, no one had agreed on an adequate definition of terms. Who were these "programmers" we were looking for? It was plain that most of the panel and delegates were no longer looking for the pure "code-cutter", but for something in the nature of a programmer/analyst, with an overall understanding of business or scientific problems and how to solve them effectively with computer aid.

Yet still, it was pointed out, there were interminable requests for "programmers with two years' Cobol experience", as though that meant something in the context of real requirements.

How to think

Herb Grosch took the opportunity to tear into personnel officers, accusing these "asinine" people of being at the bottom of such misselection by reference to meaningless "experience" in cutting Cobol code. They probably would not recognise a good quality programmer if they saw one, he said.

In fact, what was really being discussed was quality rather than qualification; which made the title of the session rather inaccurate. Qualification was touched on briefly and indirectly in the perennial discussion of the relevance of university courses.

In France, said J. Arsan, universities had begun by teaching their students programming languages. Now they were being taught "how to think", in the kind of way outlined by Jacques Hebenstreit in the education session. But employers, he agreed, did not recognise the change in training methods and persisted in asking for proven Cobol writing capability.

Angry

There was something to be gained, Arsan added, by putting prospective programming students through a normal university mathematics course; it would at least prepare them for flexible thinking in an industry where everything changed every few years.

Perhaps, Grosch suggested, there was still a role for the Cobol code-cutter as an entirely separate occupation from the competent programmer. The code-cutter, he suggested, could spend his time on the despised "maintenance work".

An angry voice (probably Professor Turski, but at that point it was difficult to see) grumbled something about such work being "beneath human dignity", and that any firm which required a program to be rewritten for the umpteenth time "deserved to die".

Turski favoured the inculcation of what theory had been learned so far in programming as the only way to train. "It is difficult to teach, and impossible to train, when you have no theoretical foundations." The relevent theory for "programming in the small" was already with us, he argued, and appropriate theoretical foundations for the more complex programming tasks now confronting us was bound to emerge in due course.

The requirement for undignified maintenance work, Australian J. Poole pointed out, came largely from badly-written programs in the first place. Through using newly available techniques to create readable and adaptable software, to create it quickly with the aid of tools and to create it so that it would be portable, one could remove a good portion of the programming forces which industry *thought* it needed, and arrive at something nearer a manageable supply-demand situation.

Grosch identified an interesting and potentially growing source of programmers among the computer hobbyists. "This was the way we produced programmers for the Univac 1," he said. "People were doing it as an interest." Now, with cheaper computing equipment available, the "hobbyist" source of programmers would be bound to arise again.

Whether these would necessarily be good programmers, and whether the quantity from such sources would make up for the quality was, of course, an important point, and though mentioned, was not tackled by the panel in depth.

Original

F. Bauer of West Germany suggested an original method of ensuring good quality programs, with a formal software contract between programmer and user – formal in the mathematical sense, ensuring that all aspects of the problem and requirements of the program were understandable to both parties, or if not, then at least to their lawyers.

We might, he suggested, have to evolve a special type of "software lawyer" to handle the wording of such contracts and act as intermediary between the parties.

The paradigm of a formal legal document was a bad one on which to base the formalisation of a program, Grosch suggested. A better framework might be that of formal logic. People who couldn't master logic, he suggested, would not be able to program.

The possibility of automating education and training was one which bore examination, Grosch said. "If we shovel people into Plato (the Control Data computer-aided education system), those who don't like it probably won't make good programmers. I'm not suggesting all those who like it will make good programmers, but a good proportion of them will."

Software engineering met with a mixed reception. For Poole, its value was dubious: one could design a very elegant car, he said, but the crucial point was whether it would run.

A truly well-designed car, and a truly well-designed program, Turski retorted, would run, by definition.

H. Maurer, of Austria, was the best prepared of the panelists with the results of an international survey conducted specially for the session, and aimed at finding out how users saw programming and what kind of programmers they were seeking. There were some unexpected replies, and a good deal of the illuminating information, he admitted, was in unsolicited remarks on the questionnaire. When, for example, he asked whether the use of software packages would increase, "some said 'hopefully, yes' and others 'unfortunately, yes'."

WITH its now name, descriptive rather than numerical, Programmers' Pagu visits the land of Kronor margarine and Kangoron bear.

Out there the IFIP conference took place recently, and included a possibly misnamed session on getting more programmers. In fact, reading not only between the lines of our man in Melbourne's report, the emphasis was more on the quality of competent programmers and the necessity for their analytical skills.

The background experience you need and the training programme recommended, to rise above the role of a mere "code-cruncher," are also quite formidable. You experienced programmers out there, sitting innocently at your desks about to put pencil to coding sheet, should have (a) a university degree in maths, (b) an automated education, and (c) a good software lawyer.

IFIP MELBOURNE

From my own past experience I would take issue with the statement that maintainance work is fit only for the lowly. To understand and amend successfully another person's logic, program and layout style, requires at least as much skill as writing your own. However, here are some interesting insights into programming half a world away.

Puzzler

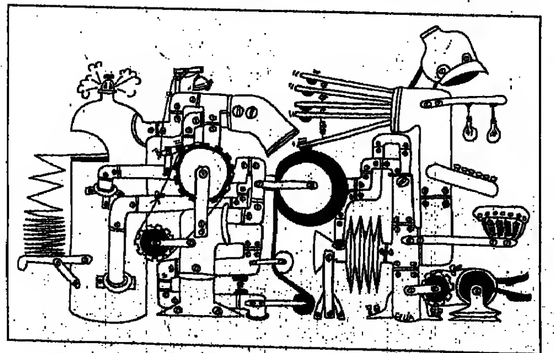
336 680 1344 486 7680 84 210

TO create this week's problem, I first calculated the areas of six different right-angle triangles, all having integer sides. Then I added another number which cannot be such an area.

Your job is to find this seventh number by scrutinising the list and also state what precept was involved in making the identification.

See page 37 for solution.

IT'S AMAZING THE COMPUTERS SOME COMPANIES HAVE BEEN TALKED INTO.



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SOFTWARE FILE

by Claire Gooding

Easing out engineers' pencil and paper methods

PROFESSIONS that used to rely on paper and pencil or a slide rule are being steadily invaded by computer techniques – and civil engineering is no exception.

INTEREST, an interactive estimating system, has been designed to make the transition less traumatic for civil engineers who are used to their well-worn manual methods of estimating for jobs.

The package was developed in Fortran by the Computer Aided Research and Development team at Loughborough University of Technology, a group which includes MSc postgraduates studying construction management.

It was developed to take the drudgery out of estimating without forcing a standard method on users whose methods and costing procedures vary. Its four main areas cope with the storage and retrieval of estimating information (either standard or from the user's own data); the assembly of unit rates using the estimator's own skill; automatic calculation and extension of the bill; and documentation before and after the tender.

The user is led through the system by menus. He can refer to a work group already stored on file and change it until the make-up is satisfactory, or build up a rate from stored or newly entered data (gash rate).

Items can be retrieved and their price changed, in case the circumstances of the job are altered. The system looks up standard Civil Engineering Standard Method of Measuring Reference Codes.

Once overheads and surcharges are added, the entire estimation is broken down into an "item make-up" which gives a description of what is needed in the way of plant, labour and material to create the structure. The costs and other elements can be expanded or modified thereafter.

The system is being sold by Genesys, which markets the widely used and comprehensive graphics system Gino. INTEREST can be used on the Genesys Design Centre mini with other design elements.

Compec-style software shows

THE race is on to provide European software vendors with a bazaar similar to shows like Compec at which hardware merchants get the chance to display their wares.

Already two rival companies have announced schemes for software shows in 1981 with dates that collide (CW, October 6). The whole idea of showing software is so new that the market may well have room for different formats, and it is worth taking a closer look at how the organisers propose to go about the business of putting buyer and seller together.

Executive Conference Organisers has released details about Soft 81 – a series of conferences and exhibitions to be held in European cities next year. Two-day conferences combined with three-day exhibitions of software are being pitched at large users and microsystems houses.

Clashes

The first show, at the Palais de Congres in Paris, takes place on June 1 to 3 and clashes with the Dutch show set up in Amsterdam by publishers Diligentia from June 2 to 4. It is followed by a show in Munich on June 10 to 12, another in London, September 2 to 4, and finally one pitched at the Scandinavian market in Stockholm from November 18 to 20.

Involved in the shows are the European Computer Services Association, Adapso, and vendor committees on both sides of the Atlantic which will determine the "shape" of the event. The idea is to give an international forum to companies which might wish to be involved in all or just their own native show.

The Europe Software show to be held in Holland, on the other hand, is designed for its own national software market and will host a large number of Dutch software companies, some of which have already registered. The international companies are expected to put in an appearance mostly to keep an eye on the Dutch market and make contacts for agencies. There will be a conference – added as something of an afterthought – as well as the trade fair.

Dr Adi Coyajee of Diligentia and of Computastars fame admitted that the clash of dates with ECO's Paris show was "a nuisance", and added: "It's a great shame that a British company has to organise a software show in Paris". Diligentia is essentially out for the same market – although limited to Dutch users – of genuine, informed and qualified visitors.

Both ECO and Diligentia are determined that the exhibition should be dedicated to the field of software with hardware kept firmly in its place – providing online connections with remote machines, for example.

Unsure

Whereas Dr Coyajee admits that he is unsure what the exhibition will actually look like, Robert Joseph of ECO has very clear cut ideas. Exhibiting companies will be invited to hold individual presentations for attendees, whose entrance to the show is free.

As well as booths, vendors will have rooms behind where they can retire to sit down and discuss the requirements of a potential customer in detail.

THE UK subsidiary of Japanese electronic firm Matsushita, Panasonic Business Equipment, has announced a range of software for use with the recently introduced desk-top computer, the JD-900 U.

The range covers standard business needs with ledger systems for sales, purchase, nominal and payroll facilities. There is also a stock control system and a word processing option.

Panasonic gives £9,800 as the price for a typical business system comprising three ledger packages and a printer.

● Panasonic's software manager Derek Hiplin (centre) demonstrates some of the software.

Wanted: one owner. Low mileage

THE American Computer Group has just set up a new subsidiary; the American Used Software Company. "Used software is the best kind", said president Bill Grinker, defining it as working or proven.

As its first software product for the Digital Equipment market, the company is offering DRS, a database management system which is said to have been in use "with over 100 satisfied users" for 11 years.

Control system first for Unix

THE advent of another Unix-type operating system (Software File, October 28), this time on Perkin-Elmer's 32-bit minis, marks the first time that the Unix Source Code Control System, SCCS, has been made available with the current version of Unix.

The Perkin-Elmer version is called Edition VII Workbench. It is based on the Version 7 Unix by Bell Laboratories and comes from the Wollongong Group in California, one of the many companies which have sprung up to provide Unix development and support in place of its originator Bell Laboratories, which is prohibited from supporting Unix itself.

The SCCS is a software development and management facility which provides audit trails for program modules and allows programmers to record changes to source files, documentation and data.

Although the SCCS was available for Version 6 of Unix, it had to be added on to the Version 7 that the company acquired from Wollongong University in Australia.

The Wollongong Group supports its operating system on Digital Equipment PDP-11s as well as the Perkin Elmer range, supplying maintenance and documentation as well as a week's training, and aid during installation.

A single user licence for the product costs $12,000, including system generation and initial support.

CAP and Pru joint insurance system to be offered in City

AN INSURANCE system developed jointly between major software house CAP and its clients, Prudential Assurance, is about to be released on the underwriting and accounting community.

The general branch insurance system was originally written to support two departments within the Pru – the treaty underwriters and associated accounts departments. The system handles current and historical underwriting/accounting data and a wide range of insurance treaty business.

The Pru runs the system on an IBM Series 1 although it was originally developed on a Digital Equipment PDP-11 using CAP's own MicroCobol. Since the language and its operating system BOS are transferable, the change-over presented no problems. This indicates that potential users could run it on many different machines.

Prepared

Data required by the Department of Trade and the British Insurance Association as well as the company's own accounts is automatically prepared, along with other necessary data about treaties and estimates.

Infotech report

THE lifespan of software and the problems of maintenance are dealt with by the latest State of the Art Report from Infotech. The two-volume report is titled "Life Cycle Management" and is available from Infotech for £150.

Update

THE New Jersey computer services firm Rapidata has announced a new element to Futurecash, its financial management system. The addition, Management Plus, allows financial analysis and planning of assets and liabilities. It operates on historical, budgeted and actual data to create a picture of a company's financial standing.

Microcode assist

MAGNUSON is to develop microcode assist features for Cullinane's IDMS which are expected to be ready by early 1981. Magnuson is using its microcode technology to speed up the most frequently used portions of IDMS routines.

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OP SPOT

by Paul Fisher

'Ops have insecure jobs — that's why they need a union'

Tim Webb is a national officer of the 470,000-strong Association of Scientific Technical and Managerial Staffs, ASTMS. In putting the case for his union, in a recent pamphlet entitled Computer Professional: Image and Reality, Webb was anxious to dispel the illusion that the computer trade offers unlimited job opportunities. In this interview he says why he thinks ops should be unionised . . .

TIM WEBB: "Operators are often housed in what is euphemistically called the lower ground floor. There is a high degree of grievance among them."

PAUL FISHER: Do you think computer operators need to be unionised?

TIM WEBB: Certainly. I think they've needed union representation for a long time because theirs is an insecure and often transient kind of job. They tend to be fairly young and something like 20% of them are female. Although this isn't a very high proportion, it's a lot higher than many other professions. The working conditions of operators are often not all they could be. They work in enclosed spaces, and while the ventilation is good, there is not always a lot of light.

PF: Some would argue that, as the demand for ops exceeds the supply and as swift promotion is open to them, there is no necessity for them to join a union.

TW: Two points there. Recent surveys have shown that the demand for operators is drastically down. Therefore the ability they had to negotiate with their feet is considerably less than it was two or three years ago. As far as swift promotion for operators goes, I don't think this is the case. The limit to which you can go on the ops side is to become chief operator and maybe a DPM. But that's about it. There's not the career progression open to them that there is for, say, a systems analyst. So unless they are retrained from one discipline to another career prospects are limited.

Hostility

PF: In the light of the hostility that some of management feels towards computer staff joining a union, perhaps it's not in the interest of an operator to get involved if he or she wants to progress a career.

TW: Well, I'm not sure there is that much hostility. By and large we have a good working relationship and find that we can be of help to companies which don't have proper contracts of employment and don't understand how to deal with their staff adequately. Nonetheless we have had bad experiences with a few companies. These companies have the idea that as soon as operators join a union they are going to put the screws on and grind the company into the ground. There are some companies which try and buy off their operators with, perhaps, a Christmas bonus or a good salary increase one year. But if the operators have a basic grievance, they will tend to join a union.

PF: What advice would you give to an individual op working in a non-unionised place who wanted to join a union?

TW: I would certainly advise anyone to join a trade union. Normally what they do is to have some form of organisation at the site. Then they could contact our local divisional office and things would start moving from there.

Tactics

PF: You'd advise them to join ASTMS?

TW: We organise more computer staff than any other union in the country and spread right across the private and public sector. The spectrum of trade unionism has risen right to the top. We organise very senior computer staff, including managing directors.

PF: Why not form a staff association?

TW: Staff associations are usually employer sponsored and are one of the tactics employers use to head off a trade union. They don't really work because they are of a consultative nature and not a negotiating body. If you had a bad tooth you'd go to a dentist rather than try and organise something yourself. In certain circumstances people must have access to professional advice which, in the case of a trade union, is based on experience at other firms. What sometimes happens with staff associations is that they have the potential to provide a vehicle for entry into a trade union. People have at least got together, even in an ineffective form, and I can think of a number of instances when a staff association has voted en bloc to join ASTMS.

PF: Could you sketch out what other unions are available to ops?

TW: You've got Apex, a clerical union which tends to be for lower grade computer staff in the private sector. Then there is Tass for the engineering industry, so they wouldn't normally organise bureau people, for instance. At ASTMS we believe there is a common occupational identity of computer staff which runs across industry.

PF: Is there a case for forming a union simply for ops?

TW: No case at all. To hive off operators from other computer staff artificially, or even white collar workers in general, would be absolute nonsense in our view. We like to believe that all our members have some kind of cross-fertilisation of experience. One of our aims is to see more operators trained and retrained to move across and up on to another career path.

PF: What would you say to the assertion that by unionising ops you are bringing strife to the computer industry such as has been seen at The Times, British Leyland and British Steel?

TW: It takes two to fight. We don't go out looking for strife. What we want is peaceful industrial relations where our members get a proper share of the cake. Every organisation has some debate about the disposal of resources and the share of the profits available. We don't want that debate restricted to the boardroom. We want the employees of a company, who are often the experts in many areas, to ensure they get a fair reward. We think it's a pretty democratic way of looking at things.

Clash

PF: Do you see a danger that, if ASTMS is representing both ops and programmers, there will sometimes be a clash of interests?

TW: Our structure takes care of that because groups are formed based on occupations—operators, systems people, managerial staff and maybe data prep. If there was an issue which affected ops, they would have their own representatives who would negotiate directly with management. At the second stage, if necessary, they could call for the assistance of a full-time union officer. They wouldn't have people representing them who didn't know their particular problems. If it was a common problem like pensions or holiday arrangements for the whole of the company, then each of the representatives of the various groups would go in together and meet the management.

Strikes

PF: I have heard it said that unions like ASTMS are anxious to recruit ops as members to exploit their potential industrial clout. Ten ops going on strike can cause enormous disruption within a business.

TW: Two things here. I don't believe operators are necessarily that powerful. On occasions their industrial power is exaggerated for political reasons to persuade them that if they join a union they will have a company by the throat and are therefore being disloyal. And secondly we have no way of making people do things they don't want to do. We don't go out and formulate a policy and then say this is what you should be doing. Neither I nor the National Executive can instruct a group of operators to come out in support of, say, the foremen or the clerical staff. People being what they are will either take action for themselves as a last resort or, if they feel that another group is being particularly discriminated against, on behalf of that group. This cuts both ways as some may feel that the operators deserve a bit of support. That is their decision. We have no way of making anybody take an action they don't want to.

PF: But, on occasions, doesn't the union make people go on strike?

TW: No way. I wish we could sometimes, but we are democratic.

PF: Do you argue for a closed shop for ops?

TW: We're not a great closed shop union and don't have any strong feelings. We find that closed shops have often arisen on the initiative of the management rather than the union itself. This is because it can lead to a tidy arrangement with no other organisations coming in. If a group of operators were to request a union shop arrangement, then we as a union would support them and talk to management about it. There is a lot of aggravation caused by people who actually refuse to participate in the union but are prepared to accept benefits that accrue from it.

PF: In putting ASTMS forward to ops, do you emphasise pay or conditions or any other factor?

TW: Pay is obviously primary for anyone these days. But what operators should also be concerned about, perhaps more so than other groups in the computer trade, are their own working conditions. We have found the heating, lighting and the general facilities to be poor even for operators working in luxury office blocks. On pay, we like to distinguish the overall make-up of the remuneration package. Although we don't encourage overtime, if people are going to work it they should be paid for it and know exactly how much they are going to earn. If they are going to work shifts, the shift premium should be distinguished from the basic salary and not included in some global sum. We want a minimum of five weeks' holiday a year plus the usual statutory ones.

High hopes at this site

INTRODUCING, from left to right, the present operations staff at the Municipal Mutual Insurance site in Maidstone, Kent: Dale Strickland Clark (systems programmer), Mike Roney (contract operator for four days a week) and Ian Cheeseman (superintendent of computer operations).

The aim is to have eight staff handling ops work when the system is fully running but this will not be for another three years. Once there is a full staff complement Cheeseman would prefer no one to have a tightly defined role. Ideally he would like to see data control, operations and systems programming all in the same department.

Municipal Mutual handles local authority work — Ally Pally, police cars, schools, employees etc. Eventually the system will assist in this work and also in an extension of the business into private work. The main application language is Cobol, although Fortran is being used in the preparation of actuarial tasks.

Since being installed at the beginning of the summer, a statistics package for life assurance has been prepared and put into action. The end of the line will be an extensive networking service.

The Maidstone installation is all-IBM, bar one piece of kit. There is a 4331 processor, 256 megabytes of disc store on 33/10, a pair of 8809 tape drives, a 400 line per minute printer and six VDUs.

● Roney, the contractor, has had his own agency since March. The Brighton-based Heron Computer Services is a small outfit with four contractors on its books at the moment. They concentrate on IBM operating systems.

Roney reckons it is an advantage being small because it means he can't get away with supplying rubbishy contract staff. In his opinion some of the bigger agencies palm off totally inexperienced contractors on their clients.

Just a mini hang-up

A FALSE floor has its uses. It hides cabling, porn, dust and other materials that people like to keep out of the way.

One enterprising, if unnamed, thinking op decided that the false floor (or lack of it) would serve as an excellent pit so he could inspect the underside of his Mini.

At 2-o'clock in the morning he managed to drive the thing through the entrance of the computer building, but unfortunately got it stuck on a half-landing. It was the like the final scene of The Italian Job when Michael Caine, his gang and their coachload of gold were left teetering on the brink of an Alpine cliff.

This particular cliff-hanger had an unhappy ending. When the daytime workers arrived they had to clamber over the stranded car — and the op was fired.

Groundless rumour

TELEPROCESSING, I am told, is one of those new areas into which the ambitious op ought to wander. But like most wonderful new areas in computing it is attended by some fairly basic practical problems.

Take the case of Minet, an insurance firm from Essex. I have heard unsubstantiated rumours about its TP network going down because it was earthing into a coffee machine.

When I rang to find out if this was true I was told that although there had indeed been a few earthing problems, someone had been pulling my leg about the coffee dispenser.

Whether or not it's one of those groundless coffee machine rumours or not, it's an intriguing idea — a telecomms network with millions of pounds worth of shiny technology being mysteriously thwarted at elevenses.

Goodbye to the QWERTY keyboard and welcome to the last word in dumb terminals.

Looking for a move into programming

AN operator, who wishes to remain nameless, wants to make the familiar move from ops to programming. He has been with British Rail for over ten years, first as a telecomms technician and then as a minicomputer operator.

He feels that within BR ops are not encouraged to progress and he is tired of the monotony of what he describes as a data feeding job.

On paper his qualifications look good, and include a BSc in maths and the completion of a three-term evening course in Fortran. He has made many applications for a programming job both within BR and in response to CW ads.

As yet he has had no success. I suggested he contact the computer consultants and systems houses listed in the Computer Users' Year Book. Other than that I was not able to give him much help.

If anybody has any useful contacts for him I'd be glad to forward them and do my good deed for the day.

Factory forum

A TWO-DAY forum called The Operations Factory starts on November 18 at the Mount Royal Hotel, London. Pitched at ops managers, the event will seek to draw parallels between industrial production and what goes on in the operations department. Anybody interested in attending should contact Bernadette Sullivan at Maidenhead (0628) 39101.

CACI
London
DATA ANALYSIS

A one-week course and workshop to be held on 8 December, 1980, at the Clarendon Court Hotel, Maida Vale, London, W9.

This is a public presentation of the course based on six years of practical development by CACI, of techniques for the analysis and development of integrated systems and is invaluable for all analysts concerned with the top-down approach.

For further details and registration forms ring Ian MacDonald on 01-405 8233, or write to CACI, Inc. International at 289 High Holborn, London, WC1V 7HZ.

MICRO NEWS

by Eileen Stainer

Off-the-shelf software from TI

USERS of Texas Instruments' 9900 16-bit microprocessor family will now be able to buy off-the-shelf software packages and optimise them to their own needs using the company's microprocessor Pascal development tool. Component software, a concept originated by TI in an attempt to reduce software costs (CW, August 14), has reached the arms of the company's nine UK distributors.

The concept was described in detail at the company's set of one-day seminars, Interface 80, held last month at the Talk of the Town. The event was organised by TI as part of a marketing campaign called HIT (high-technology in-stock thrust).

The core of component software, the real time executive, is a type of bus having a set of standards and conditions to which plug-in software modules must conform. In this way, software packages can be written for the "typical" user to plug-in to the bus.

TI relates it to Intel's RMX 86 operating system in terms of capability. However, the real time executive is available in 6K bytes while the RMX 86 takes up 28K bytes. Geoff Bristow, TI's microprocessor product marketing manager, told CW that the real time executive will be available in 3K bytes in a month's time.

If the user's needs are not completely satisfied by the off-the-shelf product, the microprocessor Pascal development tool can be used for modifications. File manager is the first of the component modules to be available, but more are to come.

Over the next two months, TI will be releasing a Maths pack for floating point arithmetic, a communications serial port controller and a data types package. Eventually it will have subsets of the real time executive on silicon.

Another product described at the seminar was "words off the shelf", which TI has termed the orator concept. The user can select the words he needs from a library of words, 200 now and 1,000 by the end of the year, and the distributor can place the speech synthesis coding for those words on to EPROM.

TI also announced a new speech synthesis chip, the TMS5200, which should be available in the first quarter of next year. The 5200 can receive commands from either the microprocessor or the 8-bit data bus, can receive speech data from the host system direct and from the ROM storing the speech code. It is also TTL-compatible and can generate interrupts.

Model

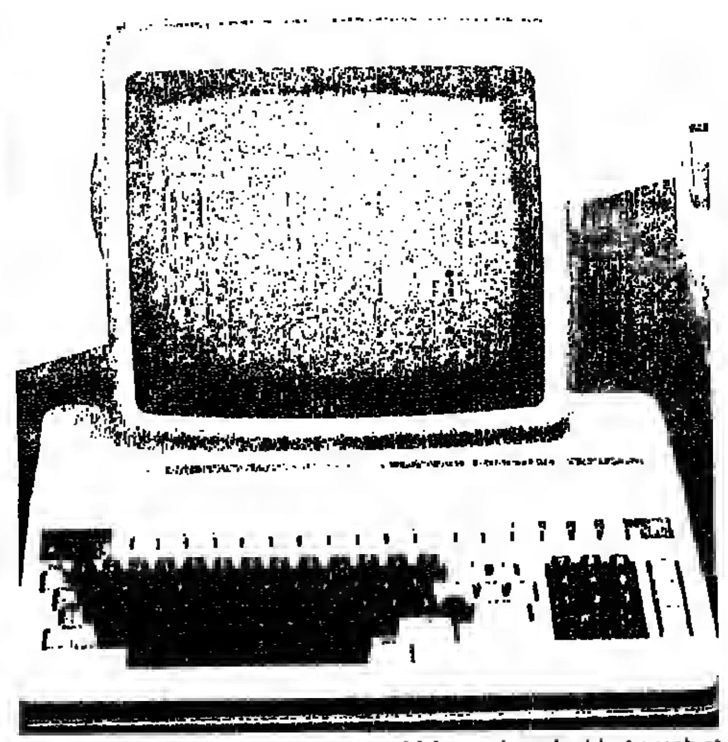
The LPC (Linear Predictive Coding) method that the company uses is claimed to achieve lower data rates than other methods. This means that a single word can be stored in a smaller space of memory. But the method does not produce the same quality as that attainable from some other methods. It incorporates a statistical model of the vocal tract and involves a prediction algorithm.

TI also talked about its new TM990E range of Eurocards, of which four are available from distributors now. These include the 990/E150 CPU board which comprises a 9981 processor, 1K byte of static RAM, 8K bytes of EPROM, six external interrupts and a timer; the E350 input board; the E51 output card; and the E252 bubble memory board which comprises 92K bits of bubble memory and a 20-bit address.

The TM990E range is based on the multiprocessing E-bus which can take up to eight masters and have 16 interrupts per master. It has one megabyte of direct addressing and serial I/O expansion of up to 4K bits. TI hopes to have these boards in single chip form in about three years' time.

The TMS9995, which TI announced earlier this year (CW, August 14), is expected to be available in volume quantities by the end of this year. This new chip is still part of the 9900 family, but is a 16-bit microprocessor with 256 bytes of on-chip RAM, making it much faster than the others in the family.

TI's operation methods involve having working registers situated in RAM. With the 9995, the registers will now be on-chip, thus speeding up operation, and there will still be the possibility of placing the registers anywhere within the RAM space.



Sharp's YX-3200 business computer, which was launched last week at Compec will be available in the UK early next year (CW, October 9). The system includes the CPU, high-resolution green display unit, dual-sided double-density floppy disc drive and an impact printer.

Low power consumption

A CMOS VERSION of Intel's 8048 single-chip 8-bit microcomputer which uses only one-twentieth of the power of the NMOS version has been developed by Nippon Electric. The device is expected to be in production in volume quantities by next March.

Like the PD8048C NMOS version, the PD80C48C CMOS version features a power consumption of 30 microwatts in the operating mode at 6MHz and of 5n microwatts in the standby mode. It has 1K byte of ROM, 64 bytes of RAM and a 97-command instruction set.

Horizon drive

A WINCHESTER disc drive for use with the North Star Horizon microcomputer is available as a standard plug-in unit from Feltham-based Hotel Microsystems. For £3,000, the unit offers 25 Mbytes of mass storage for use with multi-user systems. The company also supplies the Horizon with the 6MHz version of the Z80 CPU and high speed memory.

Motorola foresees a mixed future

THE UK semiconductor market is likely to grow at a rate of 6% in 1981 to reach a value of $685 million, according to Motorola. The home electronics and automotive markets are likely to be depressed while the computer and microprocessor applications markets are forecast to be strong and growing.

According to Dedy Saban, director of marketing for Europe, the overall European semiconductor market will only be growing at a rate of 3% more than the UK market. The company's annual market review forecasts that this market will continue to be weak at the start of next year, but will start to recover in the second quarter to reach $3,860 million.

Worldwide, the picture is similar. Motorola predicts that total world growth in 1981 in the semiconductor market will be 11%. Of this total growth, the US is expected to grow by 11%, Asia by 12%, Europe by 9% and the rest of the world by 14%.

The German market is predicted to grow at a rate of 8.5% during 1981, with most of the growth being in integrated circuits. France is forecast by Motorola to have an above average European growth rate of 11%, while Italy is expected to grow 8.5%. Scandinavia is expected to grow 10.5% during 1981.

On the product side the major growth area over the next five years is predicted by Motorola to be in MOS technology with a 27% growth rate. Total integrated circuits will grow at 21%, while discrete devices and linear products will grow at 6% and 14% respectively. These figures are all about half of those recorded over the past five years.

Motorola's own growth across the whole of Europe was 39% in 1979 and will be about 30% in 1980. The company forecasts that it will itself be number one in Europe by 1984.

According to the review, the automotive equipment market, which is now valued at $98.4 billion, will be worth $195 billion in 1985. The computer market will be worth $19.5 billion in 1985, compared with $9 billion now. The consumer, communications and industrial equipment markets will almost double in value by 1985 to $26 billion, $20.5 billion and $21 billion, respectively.

Growth rates for 1981 are predicted by Motorola to be 13% for semiconductors in the automotive field; 14% in the computer field; 15% in the communications field; 11% in the industrial field and nil in the consumer field.

The European microsystems market is predicted to grow 38% over the next year. Development systems are expected to grow 22%, box level systems 42% and board level systems 50%.

Games by post

SOFTWARE games packages for the Sinclair ZX80 and the Sharp PC1211 portable computers are now available from the mail order company Syntex Software, based in Ilford. The cassettes cost £5 and £7 for the ZX80 and 1211 respectively, and contain five games. For details apply to 96 Collinwood Gardens, Grants Hill, Ilford.

PHILIPS Simply years ahead

Announcing the Philips multi-function P7000. The one that gets it all together.

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Optimum flexibility because computer resources keep up with changing demands – hour to hour, shift to shift, month to month; one minute word processing – the next, taking orders and printing out invoices.

Planned growth because additional terminals, memory extension modules and peripherals can be added step by step.

What's more, the P7000 is installed and proven in over 30 UK sites. This is just one of a dynamic range of office machines – and all part of the wider Philips Business Systems' contribution to a whole new world of business knowledge.

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Well on the way to writing all of Shakespeare's plays at Compec? These chimpanzees were on Systime's stand to demonstrate the ease of using the firm's Word-11 word processing system.

Word processing bureau based on Microwriter

THE hand-held word processor with a chord keyboard, the Microwriter, has found a new use, enabling people to do typing work at home that can later be edited and printed out in an office in central London. A bureau has been set up by former Microwriter employee Bob Mussin to provide "cottage industry" typing using modern communications techniques, and he already has 25 staff working in Harrow and Dartford.

The typists at home can edit the text they have produced using their own television as a screen, so the Microwriter provides word processing at a fraction of the cost of a fully-fledged machine in each home. The finished text can be sent down the telephone, or on a cassette via messenger, to the bureau's office where it is printed out or edited again on a Tandy TRS82. The messengers also distribute the original dictation cassettes or manuscripts.

The bureau, called Microwriting, will also print documents for authors who have Microwriters but do not want to go to the considerably greater expense of buying a printer. The purchase price of the hand-held unit (CW, May 11, 1968) is now £485 as opposed to the £1,700 when it was first launched, and this makes home word processing much more economically attractive than hitherto.

The use of the Microwriter by typists is a departure from the original idea, which was that authors would use it, bypassing the typist. However, Mussin finds that the WP facilities plus the fact that it takes up little space in the home make it more attractive than typewriters for this application. Training time for the typists has been, he says, between two hours and two days.

The Mitcham-based Microwriter company now has over 400 units in the field at 70 different sites and has reached, in founder Cy Endfield's view, the point where it now has to expand from being a development company into a fully-fledged production and sales operation. "We know the market exists," he says. "Inquiries are escalating. The problem now is staff and capital. Investment so far has come from Hambro Life Assurance.

A stripped-down, cheaper model will probably be produced.

Swimsuit mini

SPEEDO Europe, a swimwear manufacturer and supplier based in Nottingham, has bought a Digital Equipment PDP-11/34 to deal with such applications as order entry and processing, sales ledger, cost of sales reporting and stock recording. Configuration includes a 256K PDP-11/34, twin RK 07 disc drives, plus a printer and tape drive and five VDUs.

ELECTROSTATICS GO METRIC

with 100 dots per centimetre

We're First

We're Accurate

We're Versatile

We're Ahead

We're Helpful

benson

CDC cuts cost of using Plato

CONTROL Data has substantially cut the cost of using its Plato computer-aided learning system introducing a version that can run offline from the central computer. In announcing this, chairman William Norris predicted that educational computing would become the largest single contributor to CDC's profit by 1983.

This would represent a soaring of business in a branch of CDC's activities that is not expected to turn a profit until early 1982. At present education represents $63 million of the computer company's total $2.4 billion turnover. Norris feels that the large investments the company has put into Plato are now behind it and will soon start to pay off. Plato has been under development for 18 years and has absorbed $600 million of investment.

Training

For offline working, Control Data is now providing floppy disc drives which attach to its existing intelligent terminals. Customers are expected to write their teaching programs on CDC's mainframe as now, and then down-line load them on the floppies so that training can be done without using bureau time. Students will still have to call up the bureau mainframe for testing and record keeping.

Micro-Plato, as the new service is called, is not yet available in the UK, as the US course material for the floppy discs will have to be rewritten.

Sheffield Council orders TPS

THE city of Sheffield has commissioned the TEAM TP consultancy to develop two transaction processing systems costing over £40,000, on its new ICL 2972.

The TEAM consultancy (Software File, June 26) specialises in ICL 2900 and VME development and has been called in to write a management system to control the repairs to Sheffield's 98,000 council dwellings. The other system is for the control and analysis of capital expenditure.

It will deal with inquiries and updates on all capital schemes within the Authority's £100 million budget. The control facilities will allow the user to predict the effect of alterations in the budget, and to refer to council minutes and decisions which affect expenditure.

The Housing Repairs System makes it possible to keep track of all repairs to council houses from the receipt of the complaint from the tenant up to the completion of the repair by the works department or an outside contractor.

The aim is to provide a better and more efficient service to tenants by improving the allocation of resources in both maintenance and modernisation.

First-time user slams Burroughs

A FRUSTRATED first-time user has hit out at Burroughs for its lack of support and guidance. He says his B80 – at the lowest end of Burroughs' small machine range – is not doing the job it was sold to do, and he can find no-one to sort out his particular problem.

Derek Randall, director of S. C. Randall, wholesale glass merchants, explained: "We bought the machine over a year ago, because we thought it would simplify the running of the company. But so far the only thing we've got up and running is the payroll."

Although he's attended several courses at Burroughs he has found none of them tailored to his needs, and has turned to an independent software house to write modules for his machine. After a long history of sorting out problems it appears to him that even now the machine can't cope with his requirements.

"We're fed up with phoning the Customer Support Centre to be told, 'Try this . . . ring back if it doesn't work.' It never does work," he said. "They're just fobbing us off because they can't be bothered with such a small customer. There's a feeling that they're not interested unless the customer is prepared to keep putting his hand in his pocket – and we've already *paid* for the system."

Unwillingness

"All it needs is for someone to come down for a couple of days and sort it out. But there's great unwillingness on their side to come down and sort out a problem that shouldn't have happened in the first place."

Burroughs recently emerged holding the wooden spoon for minicomputer support and services in the Computer Weekly Datapro survey (CW, October 9). The Burroughs B90 quickly superseded the B80, a dual floppy machine which proved to have too small a memory for some customers' needs.

When Computer Weekly contacted Burroughs with the complaint, a spokesman was quick to point out that the product concerned, Key BMS, was in successful use at over 600 single and over 200 multiple sites in the UK. About Randall's particular case he stated: "In such instances Burroughs does not support the modified packages as the alterations are usually done under a direct contract between the user and the software house."

Over 98% of attendees at their training courses rated them as "satisfactory" or higher, he said, and Burroughs paid considerable and careful attention to training customer support. The company is about to open a custom-built training college at Milton Keynes and is currently releasing a Systems Services Plan to users which outlines in detail those areas of support to which users are entitled, and those for which they have to pay.

Cold-shouldered

This is all very worthy, but it doesn't appear to help Randall very much. He feels that having paid his cheque he is being cold-shouldered, and he doesn't know which way to turn.

His case illustrates some of the pitfalls into which first-time users get trapped too easily. First time round the hardware roundabout they have no choice but to accept what they are told from consultants – software, hardware, or independent. The refrain is all too often "Yes, it can be done, but it will cost you."

With a standard package like Key BMS, it is all too easy to promise non-standard "bends" that can lead to much trouble and buck-passing, since the user himself is unable to tell where the blame should lie when things go wrong. Adapting to a particular company's methods (often based on familiar manual routines and not suited to computerised procedure) can lead to dissatisfaction all round.

The entire industry is turning to the "package solution" path, and for a first time user it would seem the obvious one. Perhaps the most essential part of customer education is being left out: a view of the costs beyond the hardware.

Above all someone should explain, before the sale, just what software is, and how apparently trivial alterations can cost large sums. Or might it perhaps put customers off?

C.G.

Back-end database system

THE parent company of the Adabas database, Software Ag, has announced what it calls "the first commercially practical back-end database system." The Data Base Machine is said to offer the DP community "state of the art" technology through a combination of software, hardware and support.

Rather than upgrading the mainframe, the DBM approach offloads the DBMS functions from an existing mainframe to a directly attached plug compatible machine. Software Ag claims a 60% saving in CPU time, and an improvement of 25% for database performance by this method of offloading to a back-end processor.

The DBM is also seen by the company as a strategic step towards distributed data processing, as it aims to decentralise large functions into manageable subsystems.

The DBM solution consists of an IBM compatible mainframe called the Externally Supported Processor (ESP) dedicated to the database. This communicates with the host computer through a special channel to channel communications system. The DBM contains Adabas while the host executes applications.

The ESP processor is said to have a processing speed of 0.75 million instructions per second, with two megabytes of main memory. The DBM can function in several different configurations: an unlimited number of host machines communicating with one DBM, or up to eight DBMs linked to one or more hosts.

The host machine can be any IBM 360, 370, 303X, 4300 or plug compatible under OS or MVS.

Adabas itself takes up about 256K-bytes of DBM memory with a further 20K-bytes needed in each mainframe for the communications software. This consists of a User Machine Communication Module in the host, and a Data Base Machine Communications Module in the back-end processor.

Dealer gets ITT franchise

DISTRIBUTOR Nortronic Associates of Nantwich, Cheshire has signed a franchise agreement with ITT to extend the range of ITT capacitors which it handles.

More emphasis has been placed on the distribution of ceramics with the taking on of moulded multi-layer and low voltage disc ceramics. Nortronic is stocking more tantalum products and commencing with tag ended aluminium electrolytics.

This expanded product range is manufactured by ITT at factories in Paignton, Yarmouth, Norwich and Wrexham.

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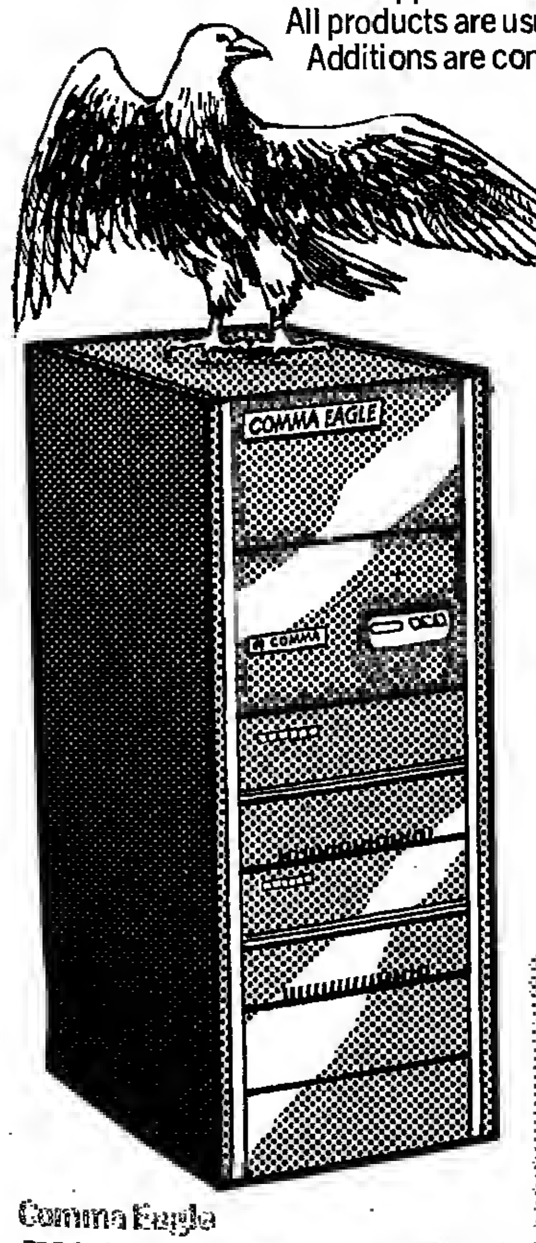
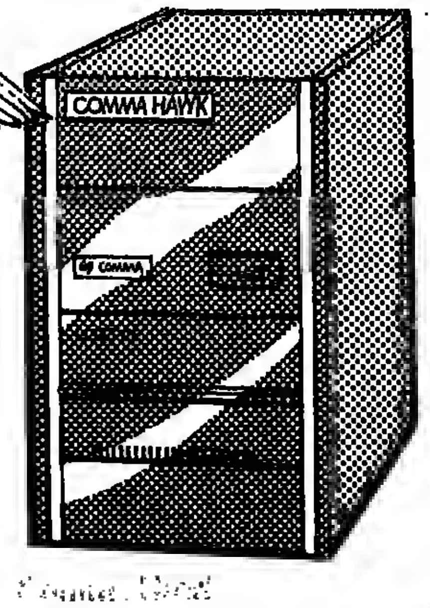
Comma Computers Ltd specialise in bringing you famous name computer products fast and at the lowest cost. Comma Computers has supplied nearly 2000 satisfied customers with a wide range of products, nationwide field service and support. All products are usually available from stock, but Comma GUARANTEE delivery within six weeks of order acceptance! Additions are continually being made to the Comma product range, so if you don't see what you are looking for, it is still worth a 'phone call to check on availability and price.



Comma Eagle

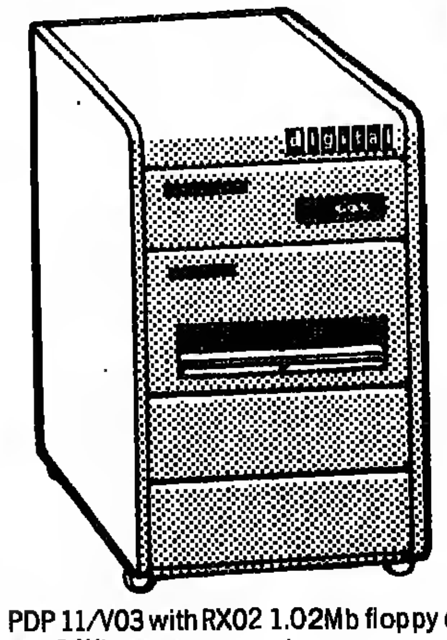
PDP 11/03 or 11/23 based system with up to 256Kb memory and up to 80Mb fixed plus 16Mb removable cartridge disk

£8,750 (64Kb)(32Mb)



PDP 11/03 or 11/23 based system with up to 256Kb memory and 5Mb fixed plus 5Mb removable cartridge disk

(64Kb)

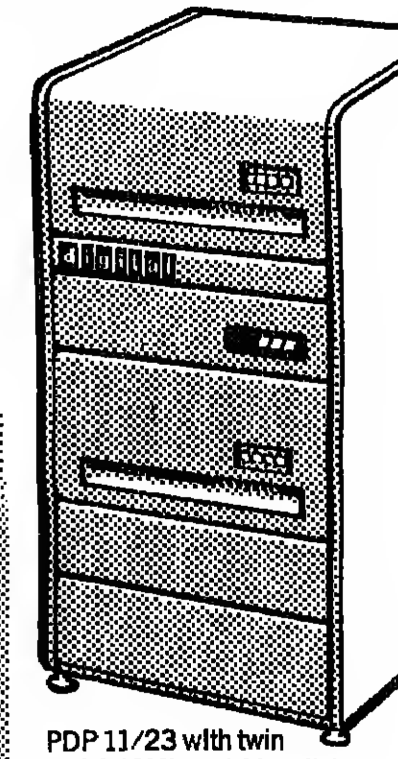


PDP 11/V03 with RX02 1.02Mb floppy disks and 64Kb memory

PDP 11/23 as above with 11/23 processor

digital

Comma Computers have available for immediate delivery a complete range of DEC PDP 11/03 and 11/23 systems at competitive prices. RT11 and RSX11M Operating Systems and a wide range of programming languages can also be supplied. Call us if you have a requirement for any PDP Q-Bus systems.



PDP 11/23 with twin RL02 10Mb cartridge disks

£10,495

Comma Computers manufactures a range of micro computer systems based around the PDP 11/03 and 11/23 processors and running under RT11 and RSX11M Operating Systems. These micro computers, which range from a powerful floppy disk system to a large multi-user configuration with up to 96Mb of disk storage and additional magnetic tape drives, represent substantial savings over their DEC counterparts.

Systems can also be configured using the DEC VT103 LSI-11 based video terminals with a number of storage sub-systems.

All the systems available, whether manufactured by DEC or Comma, can be supplied with the MICROCOBOL Operating System (B.O.S.) and any of the following applications packages: Sales Ledger, Invoicing, Purchase and Nominal Ledgers, Stock Control, Payroll, Autoclerk and Auto Index.

Call for full details of the Comma Robin, Hawk, Kestrel, Phoenix and Eagle Systems.

DEC LA34 DECwriter IV

Desktop 132 col. 30 cps keyboard printer. 9 x 7 dot matrix. Expanded characters

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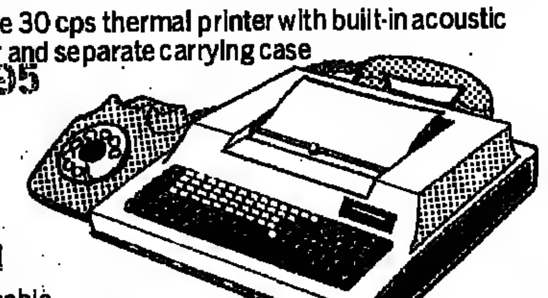
TELETYPE Model 43

Lightweight 30 cps 132 col. keyboard printer. Friction or pin feed

£695

DEC VT100 Video Terminal

Switchable 80/132 cols. Smooth scrolling. Detachable keyboard. Double width characters £995



Texas Instruments 745 Portable Terminal

Portable 30 cps thermal printer with built-in acoustic coupler and separate carrying case

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These are only a selection of the terminal products available from Comma. All terminals are supplied with 90 days warranty (30 days on site) and modem cables. Call for a quotation on any terminal requirements.

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COMPANY NEWS

DP firms join unlisted market

THE long-heralded unlisted securities market was launched at the London Stock Exchange on Monday with computer services bureau Scan Data International and United Electric Holdings among the first 11 companies listed.

The aim of the market is to encourage high technology companies which might not qualify for a full listing to come to the market for funds.

"The exchange intends to open a market to developing companies," said its chairman, Nicholas Goodison, "with a minimum degree of regulation to protect the investor. Companies quoted in this market will have their shares listed in an annexe to the Stock Exchange listing and will be allowed to place as little as 10% of their shares for purchase by the public."

The Stock Exchange will charge £1,000 a year to a company offering its shares to the public through the market. There is no initial charge for coming on to the market and no requirement for an accountant's report.

There is no bottom limit on the size of company, Goodison added, although it will normally be required to show a three-year trading record with accounts to back it up.

Pressure

There is now pressure on other computer companies to follow the lead of Scan Data (based at Haywards Heath, Surrey) and United Electric. They include Cheshire based services bureau NMW which, ironically, specialises in services to stockbrokers.

It is currently listed under Rule 163(2), an interim measure which allows trading in the shares of companies not listed on the exchange. It does, however, require the Stock Exchange authorities to approve each deal struck.

The advantage of going public on the unlisted market is illustrated by the funds which Scan Data hopes to raise. It started the week offering to sell 400,000 shares at £1.25 (10p at par) to raise £0.5 million. In fact the shares were trading at 185p at the end of the first day. This will cost about £68,000, which includes the Stock Exchange's fee, brokers' and bankers' commissions, and an announcement in the Financial Times.

The alternative is to pay about £100,000 a year at current interest rates to borrow from the banks. Scan Data managing director Martin Baldwin stands to gain £125,000 before tax by selling 100,000 of his own shares as part of the company's offering.

The company made a pre-tax profit of £162,000 on a turnover of £1.85 million in the year ended November 30, 1979.

Query hangs over C & W future

CABLE and Wireless results for its 1980 financial year, ended March 31, show a small drop in pre-tax profits but a healthy increase in turnover compared with the previous year. It rose 23.4% to £255 million.

Pre-tax profits fell from £45.5 million in 1978 to £43.5 million in 1980, but, in his last message as Cable and Wireless chairman, Lord Glenamara (former Labour MP Edward Short) warned that the pursuit of profit could never be the sole motivation of the company despite the fact that it might be on the threshold of a partial return to private ownership.

Lord Glenamaro said that the company's prosperity depended on the quality of service it gave to the governments and peoples in the countries where it operated.

The main business of C & W is operating public telecommunications services in 31 countries and territories, but the company is becoming increasingly active in this country with its maintenance services and minicomputer systems business. It also hopes to take advantage of the relaxation in the British Telecom monopoly (CW, August 14).

ACT to go public

APPLIED Computer Techniques, the Birmingham-based computer services group, is set to join the select group of UK computer companies with a full listing on the UK Stock Exchange.

Last year ACT shares became listed under Stock Exchange Rule 163(2), now being replaced by the unlisted securities market.

Since then they have risen in value from the launch price of 95p to 475p.

For its financial year ended March 31 ACT recorded a net profit of £502,798, 157% up on the year before, while its turnover rose by a highly impressive 79% to £5,568,285.

UCSL Micro snaps up PoS firm

UCSL Microsystems has extended its range with the takeover of Fieth Ltd, a Manchester-based manufacturer of point-of-sale equipment which ceased trading last month.

According to UCSL Microsystems MD Bob Gilkes, the closure at Fieth, which will now continue to produce point-of-sale equipment under its own name, came at an opportune time for his company.

He said: "The opportunity to acquire this product matched very well with our established plans to extend our markets into precisely those areas and users defined by Fieth. The new equipment and Fieth staff we have employed will enable us to implement our plans earlier than expected."

Electrical giant takes over Dicoll

DICOLL Electronics, the Basingstoke-based systems house specialising in educational and industrial systems, has been taken over by Forward Technology Industries, a public company with electrical engineering subsidiaries in France, UK and West Germany.

The 63.7% acquisition amounts to £701,760, and an additional £62,000 may be payable, based on the profits of 1981.

Dicoll Electronics was set up by the present managing director, Brian Collier, about 10 years ago and has since specialised in PDP-11 and LSI-11 computer systems and colour graphics.

For the last three years growth has averaged almost 100% a year with a turnover this year expected to be about £2½ million.

The takeover represents Forward Technology Industries' first move into the computer industry. The company had a turnover of £44.5 million in the year ending June 1980.

Dicoll used last week's Compec exhibition to launch a number of new products including a Winchester disc based LSI-11/23 computer system with 256K-bytes of RAM memory.

More dealers

The computer division of BASF has appointed three more dealers for its microprocessor based 7100 Series small business system. They are Computer Services, Canterbury; Verles Marine Computers of Erdington, Birmingham; and Davies Brown of Shoreham, West Sussex.

£780m sales

TEXAS Instruments achieved over £780 million sales for the first half of its financial year. The figure for last year was £1,300 million.

CW SHARES TABLE

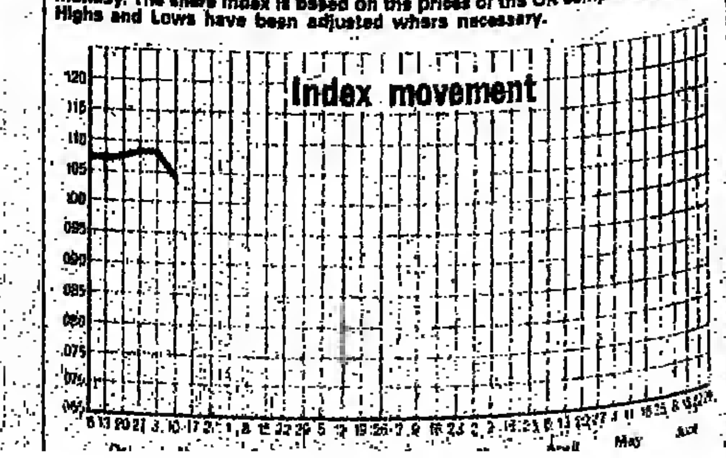
Date: 5/11/80 — Index: 104.33 Change: -2.94

Pence 1980 High	Low	London Stock Exchange Stock	Pence Price	C'nge
616	230	A Comp Tech (25p)	475	-15
94	56	BOC Int (25p)	90	2
43	28	B Bev Kent (25p)	32	–
120	82	Chubb (20p)	82	-3
100	60	Cole (R.H.) (25p)	60	-10
676	640	De La Rue (25p)	646	-20
180	146	Extel (25p)	166	–
490	234	Ferranti (50p)	457	
671	335	GEC (25p)	585	-8
181	116	ICL (25p)	148	-5
81	64	Kalamazoo (10p)	79	+3
348	203	Kode Int (25p)	330	-2
270	96	Muirhead (25p)	96	-6
357	231	Office & Elect (25p)	333	–
470	329	Philips Lamp (Fl 10)	337	+8
268	194	Plessey (50p)	252	-14
178	78½	Quest Auto (10p)	168	-2
361	109	Racal Elect (25p)	341	-10
104	86	Rediffusion (25p)	97	-3
374	287	Thorn-EMI (25p)	266	-4

$ 1980 High	Low	US Stocks Stock	$ Price	C'nge
34½	15¼	Amdahl	28⅞	+¼
32½	17¼	Ampex	29¾	+ [illegible]
61	33⅜	Auto Data Pro	47¾	+½
84	61⅞	Burroughs	63⅜	+ [illegible]
27¼	11½	Comp Automation	22¾	- [illegible]
29½	16⅜	Comp Sciences	19⅜	+½

$ 1980 High	Low	US Stocks Stock	$ Price	C'nge
21½	11⅛	Comshare	[illegible]	[illegible]
78½	46	Control Data	[illegible]	[illegible]
86¾	31⅛	Data General	[illegible]	[illegible]
94½	44⅜	Datapoint	[illegible]	[illegible]
34½	10⅞	Dataproducts	[illegible]	[illegible]
84⅞	56½	Digital Equipment	[illegible]	[illegible]
37⅞	19¾	Elec Data Sys	[illegible]	[illegible]
18⅞	6⅛	Gen Automation	[illegible]	[illegible]
81¼	29⅛	Harris	[illegible]	[illegible]
90	63¾	Hewlett-Packard	[illegible]	[illegible]
87½	66¼	Honeywell	[illegible]	[illegible]
49	27⅞	Intel	[illegible]	[illegible]
70	53⅛	IBM	[illegible]	[illegible]
29⅞	10⅛	MDS (Mohawk Data)	[illegible]	[illegible]
24½	9⅞	Magnus Assid	[illegible]	[illegible]
18⅞	11½	Memorex	[illegible]	[illegible]
21⅛	23¼	Modular Comp	[illegible]	[illegible]
70⅞	42½	Motorola	[illegible]	[illegible]
42½	17⅛	National Semi	[illegible]	[illegible]
75⅞	53½	NCR	[illegible]	[illegible]
67½	37	Perkin-Elmer	[illegible]	[illegible]
49⅞	14½	Prime	[illegible]	[illegible]
94⅞	53¼	Raytheon	[illegible]	[illegible]
55⅜	41½	Sperry Corp	[illegible]	[illegible]
29⅞	11⅞	Storage Tech	[illegible]	[illegible]
39½	29⅜	Tandy	[illegible]	[illegible]
139⅞	65⅞	Texas Instruments	[illegible]	[illegible]
78⅞	37⅛	Tymshare	[illegible]	[illegible]
34½	9⅛	Wang Lab B	[illegible]	[illegible]
19⅞	6¼	Wyly	[illegible]	[illegible]

The table shows the closing prices in London on Wednesday and in America on Monday. The share index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.



…or if you haven't got a pocket edition of th[e] Geographers' A to Z of London with you: Dorset [...] Street, S.E.1. moves to Quadrant House in Sutt[on]

This is the new headquarters of our parent c[ompany] IPC Business Press—and our new add[ress] as from 1st Decem[ber]

It's a brand-new, purpose-[built] tower block of twenty storeys [...] to a low-rise block of seven situated right by Sutto[n] station. The environment [...] the facilities are impres[sive ...] telephone system is [...] modem in the co[...] will receive just [...] answering servic[e ...]d.

This is on[ly ...]h we hope our m[ove ...]efit, not simply [...] one who has be[en ...]cting us at Dorset [...] Street, S.E.1.

We [...]rd to seeing or heari[ng fro]m you at our new address, so please make a note in your diary now:

COMPUTER WEEKLY moves on 10 November 1980 to Quadrant House, The Quadrant Sutton, Surrey SM2 5AS Tel: 01-661 3500 Telex: BisprsG 892084

Light-beam technique may make possible self-generating machines

by Rory Johnston

A REVOLUTIONARY technique for using beams of light to interconnect very large numbers of processors in an array is being devised by researchers at GEC Marconi's research labs.

It is hoped that the resulting increased flexibility and reliability will lead to a new generation of self-configuring array processors, and possibly even machines that can reproduce themselves.

The idea came from Bernard de Neumann, a mathematician at Marconi who is trying to overcome the "von Neumann bottleneck" inherent in the computer architecture invented by his distant cousin John.

Existing array processors are limited by the fixed interconnections between the components, de Neumann feels, and he would like to see arrays with 10^3 or 10^6 processors with "dynamically changing interconnection paths" using his new technology.

Mirrors

De Neumano envisages each processor being made on a single chip, incorporating a light-emitting diode and a photodiode on each. The processors would be mounted around the inside walls of a chamber, positioned so that every one is in line of sight with every other one. Mirrors might be used to assist this.

Transmission from the different processors would be multiplexed, either by frequency division or time division, synchronisation coming from a central light. Power could even be supplied through a single light source feeding photocells on each chip.

This arrangement eliminates all the connections that normally have to be made to chips and that are the commonest source of faults in conventional computers. It also enables any processor to communicate with any other processor, unlike ordinary arrays in which each processor can talk only to its four neighbours.

Fault-tolerant

The De Neumann design can therefore act like a conventional array, or a pipeline array, or a tree structure as is used for searching. It would also be fault-tolerant. Scientific work such as solving large sets of partial differential equations is the sort of task de Neumann has in mind for the machine, but it would be adaptable to a very wide range of purposes.

No hardware has yet been built in the Marconi project, but some breadboard work should be started soon. Real benefit from the idea will have to wait for implementation in VLSI, de Neumano points out. There is also a lot of work to be done on computation complexity theory, as current theory is largely in terms of conventional Turing machines.

Architecture work now being done consists largely of identifying what the chips should consist of and what the optimal store sizes and data rates are.

Excited

The theory of self-reproducing automaton shows that such an automation could be built were it possible to incorporate in it 200,000 processors. Since this is within de Neuman's target, he is excited at the possibility of building such a machine. Connecting the array processor to a "universal construction machine," with sensors and manipulators, would lead to a machine that could literally reproduce itself.

It would need plenty of hardware to find and process materials, such as mass-spectrometers, but it is something that futurologists have been seriously envisaging.

It has been predicted that a universal construction machine could exist within 100 years.

Equality at CMG

BY treating its employees equally, being open about staff salary levels, promoting from within and running an "internal" stock exchange, CMG Computer Management Group (Scotland) has won the Confederation of British Industry's 1980 Award for Employee Involvement.

At the Glasgow-based company more than 300 employees, about 50% of the staff, take part in an annual "Stock Exchange" where they buy and sell their shares in the company.

From staff to director levels everyone at CMG knows what everyone else earns. They share the same type of furniture in open-plan offices, and no one pulls rank in the car park or anywhere else.

Women have just as good a chance of climbing the promotional ladder there as do CMG's male employees. A former part-time secretary – who started with the company after her children had grown up – is now a CMG director.

CMG Scotland is a subsidiary of the CMG Group, formed in 1965 to provide a service covering consultancy systems and software work, and information processing.

● Sir Robert MacLellan, former chairman of the Scottish Tourist Board, presents the CBI award to Bob Stewart, managing director of CMG Scotland.

Tory TUs criticise govt

THE government has been severely criticised by its own trade union supporters for failing to subsidise and promote adequately the UK information processing and communications industries.

A motion to this effect, put by two managers at ICL who are members of ASTMS, was passed by a two-thirds majority of the 1,600 delegates at the Conservative Trades Unionists Conference at Reading.

Martin Roberts, the proposer, described as "unbelievable" the government's dithering over providing support for Inmos while it was providing substantial aid to Nippon Electric to set up a plant in Scotland.

Roberts pointed out that at the 1979 conference he had said it was too soon after the election to criticise the government for lack of action, whereas now, a year later, the government had in fact done "very little". He called for preferment for indigenous suppliers, and larger development subsidies.

Desk-top market shift to business sector

BY 1983, nearly two-thirds of the 425,000 desk-top computers expected to be shipped in Europe that year will go to the business community rather than to the original markets of science, education and the home.

This is one of the key predictions made in a 99-page study* from International Data Corp, the latest in its Eurocast series, which examines the Western European market for desk-top machines ranging from the Commodore Pet, Tandy TRS 80 and Apple at the bottom end to the IBM 5120 and Hewlett-Packard 9845 at the top. One common feature is the use of Basic or a Basic-like language.

Looking at the UK market, the study predicts that it will expand at an average annual rate of 43% so that the installed base will have grown to 265,000 systems by the end of 1983. Last year 60% of the 20,000 units shipped were already intended for business use and by 1983 the business sector will account for 74% of shipments.

But West Germany offers the greatest potential to vendors over the next three years, according to the study. The estimated annual growth rate will be 58% and hobby/home market sales will make a major contribution, despite the growing importance of the business sector.

France is a slow starter, with only 14,300 machines installed at the end of 1979. The main factors restricting growth, according to IDC, have been the high resistance to foreign products and a reluctance to purchase systems distributed through dealer networks.

*Desktop/Personal Computer Markets – Western Europe 1979-1983. £995. IDC Europa Ltd (CW), 2 Bath Road, London, W4 1LN. Tel: 01-995 9222.

Financial Prestel service expands

FINTEL, the Prestel information provider owned jointly by the Financial Times and Extel, last week took on board the Chartered Institute of Public Finance and Accountancy as a sub-IP and is publishing a re-formatted version of its database on local authority loans.

In the new format, details of the schemes offered by local authorities are classified by minimum investment required and minimum investment term, so that the best scheme can be picked out easily.

Also, from this month some of the foreign exchange rates available on Fintel's pages will start being updated every five to ten minutes by merchant bankers Guinness Mahon. The currencies are shown with respect to the pound and the dollar and they include Swiss francs, Japanese yen, German marks and French francs. Less accessed exchange information will be updated less often.

Commodities already enjoy a similarly frequent update rate through an arrangement with Inter Commodities, which in turn has an arrangement with Telefusion for the supply of a variety of viewdata terminal equipment. The service is to be marketed to importers and exporters.

The investment market has been identified by British Telecom as the fastest growth area for Prestel and the frames showing commodity prices are believed to have experienced a substantial jump in accesses. Scrap metal dealers are among those said to have shown a keen interest in Prestel because of them.

● Prestel sets installed have now reached 6,500 after the biggest monthly growth so far – 673 sets installed in October. The previous peak was 580 in April, after Viewdata 80. Since then the rate had declined steadily to 415 in September.

Argus 700 Series 2.

Multipower multispeed multichoice multiprocessor.

Flexibility

Argus 700 Series 2 is based on new versions of the Argus 700F and G central processors which can be used individually or in closely coupled groups supported by a multiprocessor operating system.

In its various configurations it's a package designed to meet the needs of almost all control, communications and information handling applications.

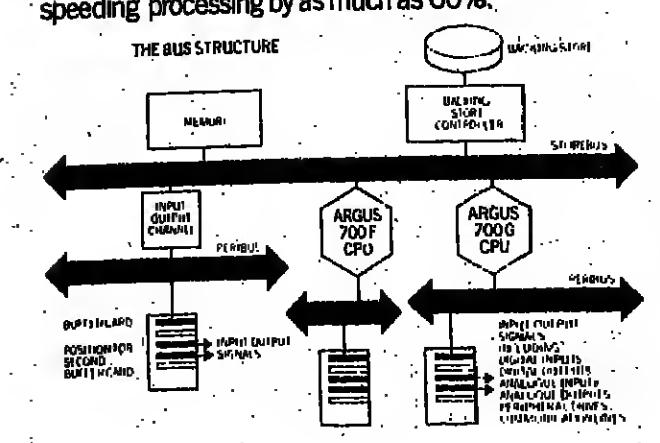
A cost effective system, competitively priced.

Speed

At the top end of the range Argus 700 Series 2 offers processing speeds of up to two million instructions per second.

There's a local and cache memory for each Argus 700F and a cache memory for Argus 700G.

Result, reduced load on the memory bus, speeding processing by as much as 60%.



Reduced Load

Intelligent channels with fixed programmes handle routine operations. They have access to the memory bus and operate in parallel with central processors, reducing the central processors' load substantially.

Security

No other computer company has more experience than Ferranti in designing dual computer systems for critical, high security tasks.

The architecture of Argus 700 Series 2 provides for pairs of computers to share memory and backing stores and to access common input/output drivers.

From the system builders.
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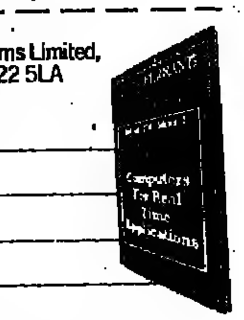

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●150 cps printing ●Full ASCII character set
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825 KSR/RO
●75 cps printing
●110-600 baud transmission speed
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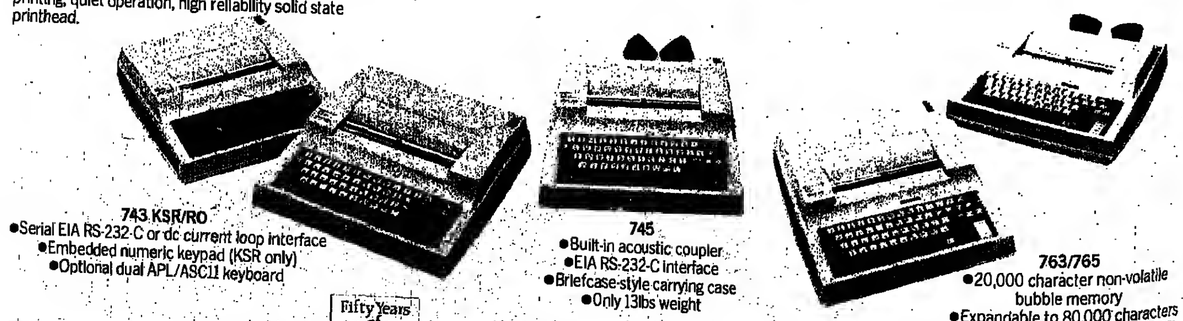
SILENT 700 FAMILY:
All with microprocessor control, 30 cps thermal printing, quiet operation, high reliability solid state printhead.



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PEOPLE and EVENTS

£1,000 for best buyer of the bunch

A SENIOR buyer for CDC has beaten more than 400 of his fellow professionals to a £1,000 prize and specially designed trophy in an annual competition. It was sponsored by a company specialising in stainless steel and aluminium workholding and stainless steel engineering.

Lindsay Hackett was judged best of the bunch in the Ravensdown Buyer of the Year 1980 competition by a team of adjudicators including Bryan Duffield, managing director of the Ravensdown Group and Alan Robertson, head of the Institute of Purchasing and Supply Training Committee.

The win comes at just the right time for 24-year-old Hackett, as he gets married in two weeks. He said, "I'm very surprised and very honoured. Competitions such as this can only be good for the purchasing profession."

Like the other competitors, Hackett, who has a degree in economics, had to submit written entries on subjects related to purchasing. He was also interviewed about his profession by the judges.

Presenting Lindsay with the trophy, Frank Holloway, managing director of finance and supplies for British Steel, described purchasing as a "Cinderella profession" and stressed that the buying function represents between 50 and 60% of a company's total costs.

Lindsay Hackett, overall winner of the Ravensdown Buyer of the Year Award, receiving his cheque from Frank Holloway of British Steel.

DIARY

NOVEMBER 17
Talk. Access to be given to a member of the company. BCS Glasgow branch. Staff club, University of Strathclyde. 7pm.

NOVEMBER 18
Inaugural meeting. Speaker E. G. Cluff. IDPM Sussex and Surrey branch. Brighton Polytechnic, Lewes Road, Brighton. 6.00pm.
Meeting. A line manager's view of data processing. IDPM W. London to Oxford branch. Bull Hotel, Gerrards Cross, Buckinghamshire. 7.30pm.

NOVEMBER 19
Meeting. The mighty and successful micro. IDPM Central London branch, Pearl and Dean Cinema, 15 Broadwick Street, London W1. 6.30pm.

NOVEMBER 20-21
Seminar. Protection against computer fraud. Insig. Intercontinental Hotel, Paris. Tel: Paris (010-33-1) 267 3600.

NOVEMBER 21
Meeting. Ultra Reliable Systems. IEE Computing and Control Division. IEE, Savoy Place, London WC2R

NOVEMBER 26
Meeting. Management game. IDPM Sheffield branch. Comshare Offices, Sheffield. 6.30pm.

NOVEMBER 26-27
Meeting. State of the Art Review. Infotech. Connaught Rooms, London. 9.00am. Tel: (0628) 35031.

NOVEMBER 27
Meeting. Word processing. IDPM Central London branch. Meaton Room, National Liberal Club, Whitehall Place, London SW1. 4.00pm.
Meeting. The Design of Distributing Microprocessor Systems. IEE Computing and Control Division. IEE, Savoy Place, London WC2R 0BL.

DECEMBER 1
Seminar. Computer Aided Production. BPICS. Garden House Hotel, Cambridge. Tel: (0279) 723554.

DECEMBER 9
Meeting. Weather Forecasting. BCS Croydon branch. Maple Room, Fairfield Halls, Croydon. 7.15.

DECEMBER 10
Meeting. Role of mathematical programming. BCS. London School of Economics, London. 6.30.
Meeting. Computers in Museums. BCS Information Retrieval Specialist Group. Tickets from Huntingdon Research Centre, Huntingdon, Cambridgeshire, PE18 6ES.

New offices for two companies

A PERIPHERAL Products Division has been set up by PRCI (UK) in Barrasford House, Goldsmith Street, Nottingham. Telephone (0602) 415155. The new division will handle a range of peripheral, terminal and ancillary products. Sales manager is Colin Zardin, formerly of Centronics.

Mascom Systems Ltd, which has its headquarters in Luton, has branched out to London with the establishment of a new sales office in Connaught Place, W2. Telephone 01-724 2638. Jeff Lewis will head the office as sales manager.

Maurice Garnar has been appointed to the board of Microlec. He is a Fellow of the Institute of Chartered Accountants and has been in petrol retailing for 18 years.

Jeffrey Pitteway has joined Recognition Equipment Ltd as marketing manager for its range of OCR data entry systems. He formerly held positions with Management Sciences of America and Univac (Canada).

Ray Weston has joined GST Computer Systems as principal consultant in industrial computer application. He was formerly a managing consultant with the Industrial Division of IAL Gemini.

Don Philip has been appointed marketing consultant at Geest Minicomputer Systems in the Birmingham office. Prior to this appointment he was with Thornton Baker Associates.

Richard Ackroyd has been appointed European sales manager at Isovel International. He was formerly with Denco Miller, where he worked as air conditioning export sales manager.

Tom Busby is the new company secretary at Computer Automation. He has previously held positions with ITT, Pye and, most recently Borg, Warner, where he was controller and divisional director of the company's Transmission Division.

Robert Ford has been appointed manager of the Private Communications Division, at ITT Business Systems. He joined the company in 1962 and worked most recently as technical and planning manager.

John Flynn has been appointed marketing director of H&T Components. He is a member of the Institute of Marketing, and joins H&T from NCA Security Systems, where he was marketing manager.

Ray Darker has joined Lion Microcomputers as sales executive.

Institute of Marketing names six vice-presidents

THE Institute of Marketing has appointed six new vice-presidents, two of whom are from the computer-related industries.

Sir Kenneth Corfield, chairman of Standard Telephones and Cables and Edward Nixon, chairman of IBM, will sit on the Institute's newly established President's Advisory Committee for two years. The main purpose of the committee is to create a high level of consultation, discussion and influence within the structure of the Institute.

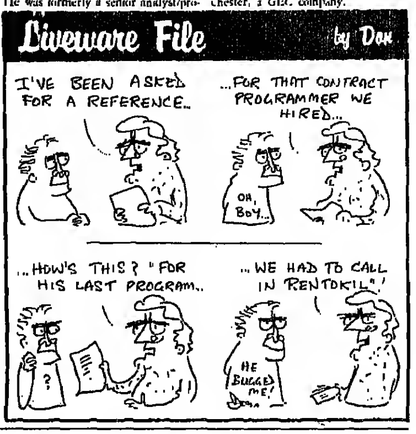
Other appointments are Sir Montague Finniston, former chairman of British Steel; Sir John Greenborough, immediate past president of the CBI; Ronald Halstead, chairman and managing director of Beecham Products; and Patrick Neary, managing director and chief executive of Thomas Tilling.

Dennis Prater has been appointed computer manager at BP Chemicals in Antwerp. He joined the company in 1951, and takes up the new post in Belgium after spending 10 years as manager of BP Chemicals Western Region at Baglan Bay in South Wales.

Derek Hipkin is Panasonic Business Equipment's first software manager. He was formerly a senior analyst/programmer, working on the development of software packages.

Paul Cokerhanr has left his position as managing director of Hardata to become managing director at Alpha Microsystems. Iorwerth Evans has joined the company as sales director, having previously spent three years as commercial director of Woods of Colchester, a GEC company.

Liveware File by Don



IBM introduces new ways to improve office productivity.

Sometimes it seems that there just aren't enough seconds in the day to get all your work done.

In an age where technology can move information at electronic speeds, it can still take days to get a finished document into the hands of the people who need it.

But now IBM introduces a wide range of major new office systems and programs.

No matter what your business – no matter what its size – these new offerings can help improve your business productivity.

EFFICIENCY FOR TODAY-MODULARITY FOR GROWTH TOMORROW-THE IBM DISPLAYWRITER.

This may be the easiest word processing system that you've ever used.

The new IBM Displaywriter can show you how to process words. Just follow the instructions on its screen, which guide you, step-by-step in creating, revising and editing documents.

It can even check your spelling at up to a 1,000 words a minute using its electronic dictionary of 80,000 words.

With the communications options, you'll be able to send or receive information from other communicating IBM office products, and suitably programmed computers.

And because the IBM Displaywriter is modular, it's flexible. As your company grows in size your Displaywriter system can also grow in size and capability.

So you only buy as much as you need. You may want to design your system initially for one person, then graduate to two or three – by adding more display screens and keyboards, and later perhaps faster printers. Or start with basic word processing and add more software programs as your needs grow. This is why it can be more efficient and more economical.

And although a major design concept was ease of operation perhaps the easiest thing about it, is it's price. Would you believe from £4,878* plus software?

DESIGNED FOR THE FAST FLOW OF INFORMATION-THE IBM 5520 ADMINISTRATIVE SYSTEM.

The New IBM 5520 combines many office administration activities with electronic document distribution.

Word Processing – from the same visual display unit secretaries can create, edit, revise, sort, process and distribute business information, as well as handle normal correspondence.

File Processing – with the 5520 you can add, subtract, multiply, divide and compare numeric information within files. It can also perform multi-step tasks with just one instruction.

Electronic Document Distribution – documents can be transmitted in minutes – to a single person, to a distribution list, or a combination of names and lists – and the 5520 gives confirmation of delivery.

It's easier than you think. For example, special instructions appear on the screen in plain English when help is requested and you can control many different functions from one work station.

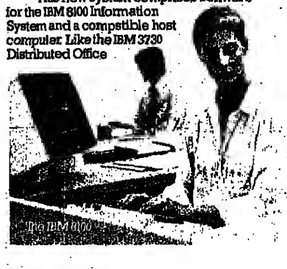
In fact, the 5520 can do several things at the same time. As well as the communications activities, many of the traditional word processing revision and pagination functions can, if desired, be carried out by the system automatically, thus leaving the secretary free to undertake other tasks.

The IBM 5520 is an integrated system supporting multiple work stations, all sharing the same information and facilities. And the 5520 can form part of a network exchanging information and documents with other 5520's, suitably programmed System/370 computers as well as the new Displaywriter.

THE NEW DISTRIBUTED OFFICE SYSTEM FOR PROFESSIONAL BUSINESS PEOPLE.

The IBM Distributed Office System boosts productivity in text and data handling by bringing the function and power of central computers to the fingertips of your secretarial, administrative, and professional staff.

This new system comprises software for the IBM 8100 Information System and a compatible host computer. Like the IBM 3730 Distributed Office



Communications System on which it is based, it provides word processing capabilities, administrative functions, integrates text and data applications, and caters for information retrieval and the distribution of documents over telecommunications networks. It also makes publications production possible at your central computer.

By providing extensive text and data processing functions the system can handle both secretarial and administrative tasks in a manner that allows integration with the business communications needs of professionals and managers.

Key elements of the new system are pre-packaged, pre-tested, and ready to install.

The new Distributed Office System brings powerful computing to company-wide business communications.

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Channelling raw materials into usable products

Part 2 of our series examining the role of computing in a multinational.

HUNDREDS of BP companies are active throughout the world in operations ranging from basic research to exploration, production, refining, and marketing. The channelling of natural resources such as oil, minerals, coal and metals into products for the market – whether energy-based (ie petrol, coal and natural gas), chemical derivatives of these (such as ethylene), or consumer products – involves thousands of operations and processes.

In recent years there has been a significant growth in the use of computer based scientific and technological disciplines at every level throughout the BP chain. We have selected just a few examples from each area of activity.

During our research into BP, one of the interesting points we have discovered is the high degree of involvement of researchers and engineers in various disciplines – such as geophysics and chemistry – who are involved in specifying and developing their own computer systems. Various aids for the development of systems are being made available in BP.

One example is the Unix operating system. BP is about to become one of the first commercial organisations to use this system as a PWB (programmer's work-bench). Two systems are to be installed, one by BP Trading and another at the Research Centre. BP sees the use of such systems as particularly important, certainly in the scientific area, where the many graduates that the company employs each year, from a variety of backgrounds, now take for granted that such computer facilities will be available.

The PWB/Unix system will run on PDP-11/70s and will be used principally for program development. It will also provide text editing and electronic mail facilities. An important feature of the system is the capability to provide convenient RJE and asynchronous links to other computers.

Powerful

BP Research Centre's Unix System, which will be used for Fortran program development, is going live this month (November) and will initially use 20 Perkin Elmer (PE) terminals. The Unix software is being obtained from Interactive System Corp (ISC) in the US. ISC has modified the PE terminal to produce a device that has a powerful program development station and yet also incorporates flexible word processing features.

The BP Trading Unix System will also use ISC software but will have 40 Digital Equipment VT 100 terminals, again modified. This system will be used for both Fortran and Cobol program development.

A source code control system will also enable a number of users to develop large systems interactively between them, on their individual terminals, without any confusion between users.

The Research Centre makes

A scanning transmission electron microscope used in the elemental analysis of protective coatings for steels at BP's research centre.

extensive use of micro and mini-based systems in such applications asn engine test beds, real time fuel consumption analyses, and monitoring of energy and heat conservation in experimental low energy houses (in this experiment, temperature comparisons are analysed on an Apple II).

One project, for example, will link eight different pilot plants for the testing of new catalysts, new processes, etc. This will be an online, continuous process, distributed network based on small satellite minis each dedicated to a particular plant. Each satellite mini will handle 30 to 40 control loops and be linked into a PDP-11 used for overall system control and monitoring and for switching data into Univac mainframes to handle complex analyses. This completely automated system is expected to make a significant contribution to improving existing refining processes and in developing new processes.

The fruits of such computer-based research eventually find themselves in practical use in the many BP companies involved in exploration, production and refining. Computer techniques are now being used, for example, in data analysis of seismic surveys. Micros are used for data gathering which is then processed on BP's large Univac 1100s.

Such logging systems, covering exploration for oil, gas and coal etc, involve large volumes of physical measurements from exploratory bore holes and oil producing wells, and these need to be translated from magnetic tapes produced by the logging systems. Information from the North Sea and other exploration regions is stored on a database, and can be accessed online, enabling engineers to study individual wells or complete oilfields.

BP also employs the Eva financial modelling system for business analysis, planning and decision making on coal and minerals production projects, while a range of graphics subroutines is available for incorporation in user application programs. Tektronic colour terminals, for example, are used to translate numerical output into a picture base of seismic data giving the user the ability to change scales, annotate, rotate, etc at will.

Longest

In one current development, senior management using graphics techniques utilises an information system of world natural resources. This colour graphics system is being developed on an IBM 4300 Series machine and will enable graphical monitoring of resources, such as oil and coal, and of progress made in the North Sea, to be made against resources, the budgets required for their production and the availability of specialist personnel.

Extraction of natural resources also requires a high degree of computing assistance. BP's development in Alaska resulted in one of the longest pipelines ever, but posed some of the most difficult environmental problems yet found in oil production. The largest oil field in North America, 250 miles inside the Arctic Circle produces oil from a number of well-heads, transferring it to three gathering centres from which it passes through a series of processes including the separation of gas from oil.

Freezing Alaskan conditions mean that the number of personnel should be kept to a minimum at the gathering centres. To assist

● Turn to page 17

Control room of the Rigidex No 2 high density polyethylene plant at BP Chemicals, Grangemouth.

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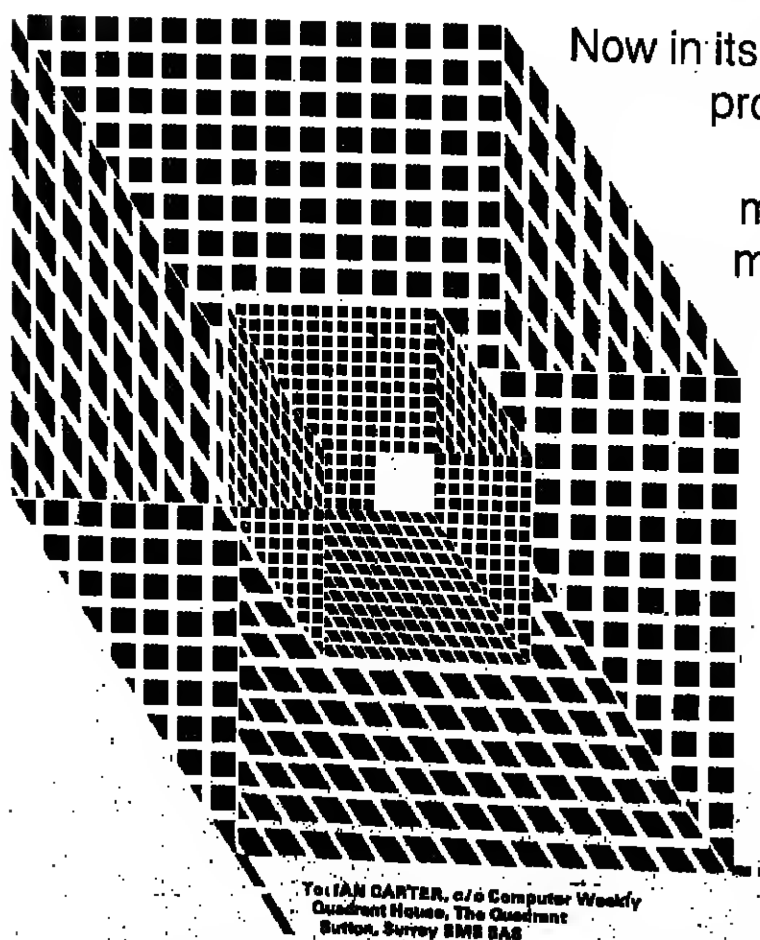

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Control room in main operations control at BP/Sohio operations centre, Prudhoe Bay, Alaska.

Blending model

From page 16

this, Scicon developed for BP a process supervisory and control system, which is operated from the main centre in Alaska. A microwave communications system is used for data gathering, the information being stored on a database.

The system is based on two Honeywell process control HS4400 computers. Four thousand remote analogue and digital points at each of the gathering centres are regularly scanned, updating the database online. The system, which has interactive display facilities, also allows automatic scheduling and control of oil well flow production rate, with verification against the planned characteristics of each well.

Environmental conditions have also posed problems in North Sea oil development and it has proved necessary to create simulation models for North Sea supply. The models, which are available to outside users, contain all the possible variables matched against detailed records taken from operations over, say, the previous six months.

Outputs from the many real time or process systems that capture, analyse and produce information from areas such as the North Sea, are utilised centrally by BP Trading for oil production accounting systems. Information on reporting and the recording of hydrocarbon movements, as well as analysis data from terminals, pipelines, platforms and refineries, is validated and stored on disc for later use. Proration (a form of mass balance and reconciliation) is carried out against measurements from other areas.

Matched

Apart from making it possible to schedule items, such as tanker movements, or analyse trends, data interaction between the many systems involved also enables information reporting for managerial and operational departments, as well as government bodies, for example, providing the Department of Energy with BP's North Sea petroleum production returns.

On a worldwide basis, the availability of crude oil must be matched to the demand, and this involves a complex co-ordination of all transport, refining and storage resources. Such an operation is the responsibility of BP Trading's supply department, which uses linear programs for broad strategic planning for up to two years ahead, as well as the day-to-day control of shipping movements. Additionally, the system, developed by Scicon and known as MDF (Moving Data Files) provides daily management information.

MDF utilises a master file based on a number of inter-related file structures in which each file is independent of the others. The whole system is updated from other computer systems. Up to 150 requests a day are issued to the report generator program which enables users to specify a variety of criteria for data. A high degree of automation and process control is involved in the refining of crude oil into petrol, oil related products, or chemicals. Mathematical programming techniques are used in areas such as vibration analysis and heat transfer calculations on heat exchanges. Complete mathematical modelling of refineries is a widely used technique within BP, enabling production plans for new plants and refining processes to be designed. The optimum combination of operational capabilities, product demand, availability of feed stock (crude oil, etc.) can be determined before any change in refinery production process is considered.

Blended

BP Trading's processing department is constantly involved in the development of specific models and process techniques. For example, it has developed an online linear programmed interactive blending model that can be used to maintain a multi-component line blend within the specified limits of several parameters. For example, a fuel oil can be blended to maintain its sulphur and viscosity specifications.

Advance scheduling systems are also now being developed by the refineries department in conjunction with Scicon. The first of these, due for installation early next year at BP Oil's Kent refinery, will run on a Digital Equipment VAX and will use a BP-developed command language which enables non-computer users such as refinery schedulers and chemical engineers to control the program and impose their own rules for the selection of any simulation. In this respect, the only restrictions placed on the user are those assumptions which result from the natural laws of chemistry, physics or chemical engineering in the context of refinery operations.

Maintenance departments in refineries also have a need for comparison and utilisation of volumes of data in different formats and from different sources. To assist the maintenance operations in their oil refineries, BP has developed an online maintenance and reliability tracking system known as Smart. Based on a Hewlett-Packard 3000/33, the system utilises VDUs in various parts of a refinery site with printers where necessary. The first Smart system is being implemented at BP Canada's Trafalgar Refinery near Toronto.

BP Chemicals has also developed an online maintenance system especially tailored for chemical production. The EPAC (Engineering Planning And Control) system is being implemented on the ICL 2903 in South Wales. It keeps records of parts and of maintenance scheduling, historical records of parts failures, etc and can be accessed by maintenance engineering staff through VDUs at a number of locations around the chemical processing plant.

Parts records input to the system are quite substantial. BP Chemicals has so far put some 20,000 records on to the database using in excess of 42 megabytes. The total number of items is expected to rise to over 50,000, some 10,000 of which will be regularly accessed.

Mathematical modelling is also used for refinery production planning. BP Chemical's POMP (Production Operations Management Program) is a system which utilises co-ordinated data from all factory sites as well as head office. Pomp enables calculation of potential plant requirements to be made, with forward estimates for up to 18 months. The system aims to minimise costs, subject to company strategies on, for example, stock holding, and it enables both production and commercial staff to view alternatives based on "what if?" questions.

Scans

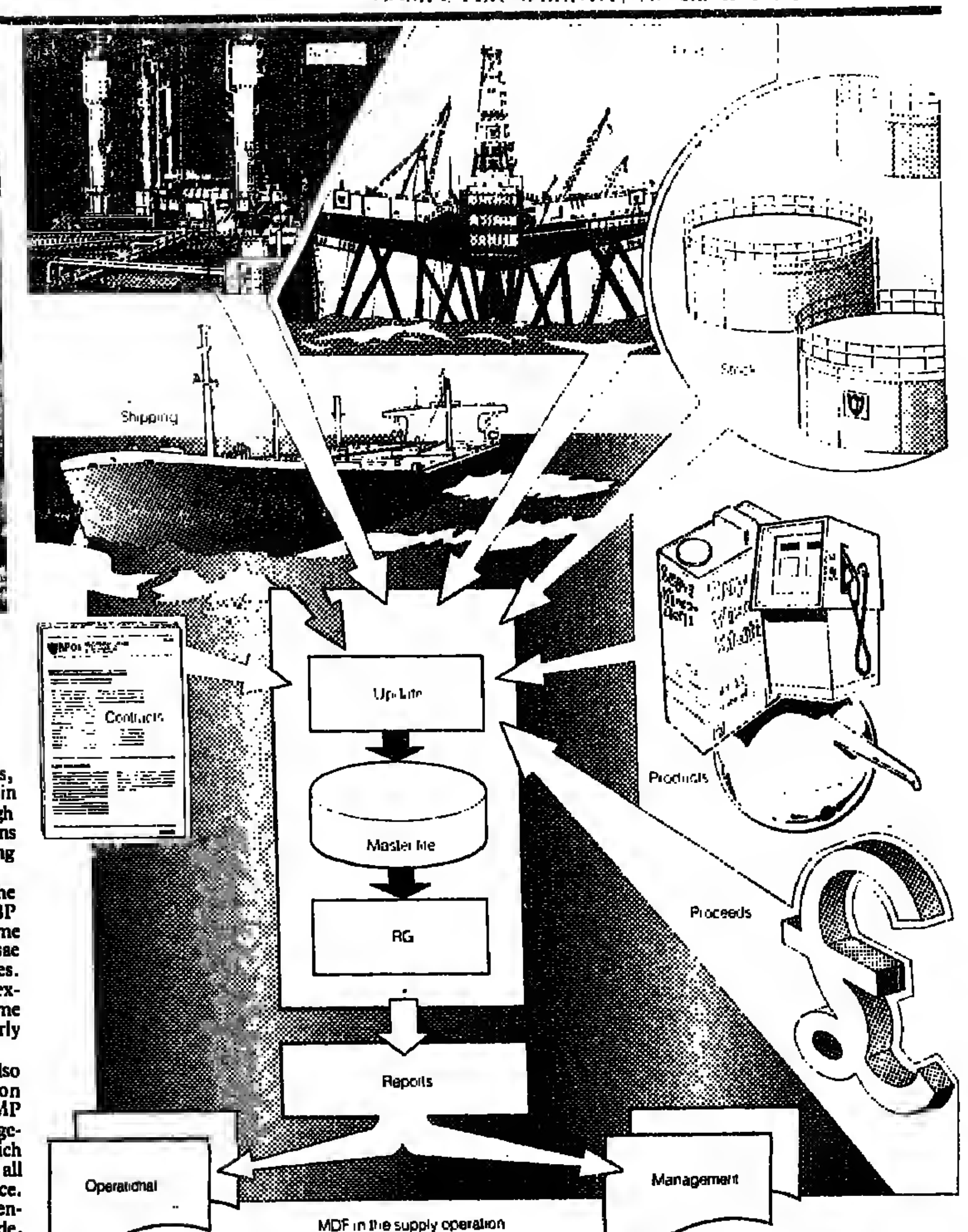
At BP Chemicals' Baglan Bay operation three manufacturing plants each use a Ferranti Argus system for data collection from various processes within each plant. Fifteen-second scans are integrated every hour so that temperature and pressure flows, etc can be compensated. A fourth Argus is used to access and consolidate this information three times a day, and to provide average production data for daily logging onto disc on an ICL 2972, which then writes the information to a history file.

The various processes and their efficiency are reconciled by comparing the raw data as logged against a model of the process involved. A reconciliation for each process is carried out via the Argus system and further consolidated against a model run on the ICL 2972 to produce a total reconciliation for the entire processing site. The resultant output provides the input data for systems such as Pomp.

Technical and scientific computing in BP involves many more applications than we have room to describe. These include, for example, a Rair Black Box microprocessor system used to track BP Chemical's acetyl acids stock levels and distribution throughout Europe.

Yet another system is a 30-terminal transaction procurement system run on BP's Univac 1100/21 which uses Wang word processors to produce orders and to access the system for financial data. Over 5,500 online accesses are made to the procurement database each day.

Hundreds of similar applications exist throughout BP, and next week we will describe a few used for accounting purposes.



BP Trading's MDF system performs broad strategic planning and the day-to-day control of shipping movements as well as providing daily management information.

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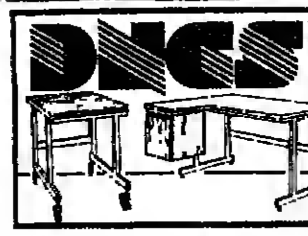

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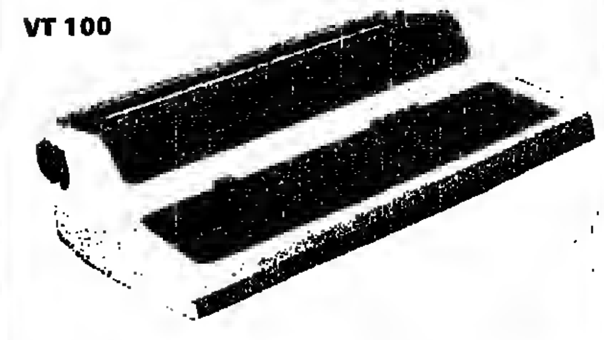

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DATA ANALYSIS

Defining what the business does

by Rosemary Rock-Evans

Section I — Part 7

of our series describing a system design methodology

IN the previous parts of this series, we have concentrated on entity analysis, and the way in which the entity types a business is interested in can be defined and their relationships modelled, using an entity model.

The following two parts will introduce aspects of functional analysis, the activity carried out in parallel with entity analysis, which defines *what the business does*.

Functional analysis has many purposes, which will be explained in detail in later articles. Briefly, however, the main uses are:

- To find out the business activities a system or systems must support and hence what applications will be required.
- To refine the entity model.
- To design the database, as functional analysis provides quantifiable information on the way in which the data in the database will be used.
- To provide the basis for designing transactions.

There are two concepts used in functional analysis, those of a function and an event.

Functions

A function is a business activity. It is what the enterprise does in order to operate, for example, it pays people, handles orders, deals with enquiries, controls lending, and so on.

But strictly speaking these are *functional types*, a function occurrence or execution being the payment of a specific person, the handling of a specific order, etc.

A function type is not defined in terms of who performs the function — the same function type can be performed, quite legitimately, by a number of people, possibly for different purposes.

Nor is it defined in terms of how its inputs and outputs have been implemented, eg, Use form XY22 and fill it in; nor is it defined in terms of machines, eg, Use a pocket calculator to calculate interest. A function states what is done and refers only to entity types, entity sub-types and attribute types. (How the function is carried out is decided later during the design stage.)

Thus the three basic rules when determining the defining functions are:

1) Never mention people or jobs.
2) Never mention forms, output reports or other procedural things: only refer to entity types or entity sub-types, attribute types or values.
3) Never mention machines, such as computers, typewriters, etc, which are involved in the *implementation* of the function.

Several aspects of functions are worth noting:

1) Each function is an action upon something, expressed in terms of a simple declarative statement which consists of a verb and an object, eg, calculate (verb) interest on a loan (object).
2) Every function must involve the transformation of some "input" to some "output" and functions are related by their output and input — one function may produce output which is another function's input. Both output and input will be entity types, attribute types, relationship types and values and we shall see in later articles that many functions result in a change of state of an entity.

Implication

In Figure 1 the "input" and "output" of some example functions is shown. Notice that some functions have multiple inputs. Notice also the example where the "Packed Labelled Goods" output is part of the input for the "Deliver Goods" function. The implication of these features will become apparent when functional decomposition and data flow diagrams are discussed in later articles.
3) It is important to emphasise that no distinction is made between functions which are physical tasks, clerical functions, and managerial functions, such as decisions. We are studying the business and how it operates, not just the tasks we may think could be computerised.

The knowledge of the existence of a physical or decision task, for instance, is as useful during the design of a system as knowledge of the existence of a clerical task, simply because it helps the analyst to understand the dependencies between functions and hence how the business as a whole operates. This is particularly important during transaction design as the initiation of the transaction may be dependent upon the completion of a physical or decision task.

4) Functions may exist which are not executed for every occurrence of their object entities. Such function types are termed optional and the conditions under which they will be executed must be documented. For example the function "Cancel Patient's Appointments" will be executed only if the patient has appointments.

Optional functions depend upon the values of attributes and/or the participation in relationships of their object entities. The use of the word "may" with the verb and/or a condition clause usually indicates that there is optionality, so that the function above would be better described as "May Cancel Patient's Appointments if any exist".
5) In many cases any one of a group of functions may be executed, but not more than one. These are termed exclusive function types. Again the condition determining the function's selection for execution must be documented. For example, the functions
"Handle Patient's Death If In-Patient" and
"Handle Patient's Death if Out-Patient"
are mutually exclusive. We shall see later in the series that exclusive function types often have entity sub-types as their objects.

An event is the stimulus or trigger which initiates one or more functions. Every function is triggered by an event, even if it is only the simple event of the preceding function having been completed.

Events are of interest because:

- They are used in determining the transactions required in the system.
- They help to identify the functions of the enterprise.

The events in which we are particularly interested for transaction design purposes are the events which start or initiate a chain of functions. Those events which simply mark the expected completion of one function and hence the start of the next, are of less interest.

In Figure 2 some examples are given of initiating events. Events are either:
1) External to the area under study, ie not generated by the business operations of the particular part of the business being studied, OR
2) Internal to the area, ie generated by the business activities under study, and dependent upon situations fully relevant to that part of the business. These situations are likely to be the success or otherwise of a previous function, a managerial decision, or a specific time being reached, eg month end.

The relationship between functions and events is quite complex. An event can initiate more than one function, but in turn a function can be initiated by more than one event. But exploring this relationship can help the analyst to decide where functions are missing and which events can be grouped to form transactions.

Determination of events and functions

Simply because function types describe what the business does, the best person to determine the function types of a business is the user in conjunction with the analyst. This is no different from the way in which a systems analyst would normally complete the "user requirements" stage of a system, except that the framework provided by functional analysis provides a better tool with which to analyse the results of interviews, and the existing documentation and procedures. Another article in the series will be dealing with functional decomposition, which describes how the function types are documented and broken down as more is known from the user. It may be of interest to know that in some cases users, with tuition, have performed functional analysis without analyst assistance.

The following points may help in determining what the function types of an enterprise are:

- Function types and the organisation of a business are *not* the same. It is dangerous to assume that the jobs and divisions in the organisation can be used as a basis for functional analysis. One of the uses of functional analysis is to show where the organisation and functions of an enterprise are different, or even in conflict, to indicate where rationalisation might help the business.

Tangible

- If a procedure manual for the area under study is available, this will often specify many of the functions which are completed in the area. These are usually found within the description as "active verbs" describing things that are done.
- Functions sometimes produce tangible "end-products". It is therefore often useful to understand what the end-products of each function type in the area under study are. "End-product" should not be confused with reports or documents presently being produced, as these may be the results of inadequate systems. "End-product" simply means the known necessary outputs of the overall function e.g. the contents of a payslip, P45, P60 etc. for the "pay people" function; a priced, validated and edited order as a result of the "handle order" function.
- Since events are the trigger to functions, the events should be used as a prompt for the user, to make sure all the functions have been covered.

In order to determine events the following questions can be useful:

- Which events can cause an entity to "die" or become of no further importance to the enterprise?
- Which events cause an entity to be "born"?
- Which events cause a change in the values of each attribute of an entity?
- Which events cause a change in the relationship between entities, ie establish the relationships or break them?

It is also useful to bear in mind the following points when considering events:

- Inquiries and decisions are events.
- Events can be regular — month end, or irregular — person admitted to hospital.
- Events can be predictable — operation completed, or unpredictable — person dies.
- Events can be normal — patient arrives for an appointment, or exceptional — patient fails to attend appointment. The regular predictable events are usually the easiest to determine, because the user deals with them the most frequently. It is the unpredictable and exceptional which require more intensive study by the analyst to discover.

In this article the two concepts of the event, or trigger, and the functions, or activities, have been introduced. In the next part of the series we will go back to entity analysis and introduce the new concept of attribute types which may be dependent on functions.

The Data Analysis methodology was developed at CACI by Ian Palmer.

INPUT	FUNCTION	OUTPUT
Unpaid people, pay details	PAY PEOPLE	Paid people
Unpacked goods in stock, order details	PACK & LABEL GOODS	Packed labelled goods
Unallocated patient, ward information	ALLOCATE PATIENT TO WARD	Allocated ward Patient
Packed & labelled goods, delivery details etc	DELIVER GOODS	Delivered goods
Patient booked for operation, operation schedule, doctors etc	OPERATE ON PATIENT	Patient who has undergone operation

Figure 1.

EXAMPLES OF EVENTS OF INTEREST

Event
Person dies — an external event.
Patient books appointment — an external event
Operation completed — an internal, physical event.
Month end — an internal, time-dependent event.
Person's medication to be changed — an internal event, based on a doctor's decision.

Figure 2.

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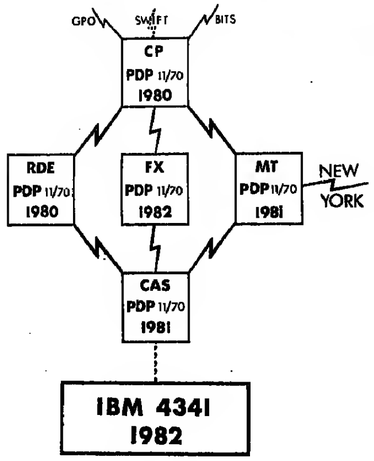

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Greenock House 19 Cuckfield Road Hurstpierpoint Sussex BN6 9RF

Telephone: Hurstpierpoint (0273) 833848

THAMES VALLEY

U.K. MARKETING AND SALES MANAGER

(BOARD OPPORTUNITY)

C. £25,000/£30,000 **+ EXECUTIVE CAR + FRINGE BENEFITS**

Our clients are one of the UK leaders in the Software and Consultancy Field wishing to appoint a high calibre Manager to fill the above position.

Candidates will be expected to meet all or some of the following requirements:

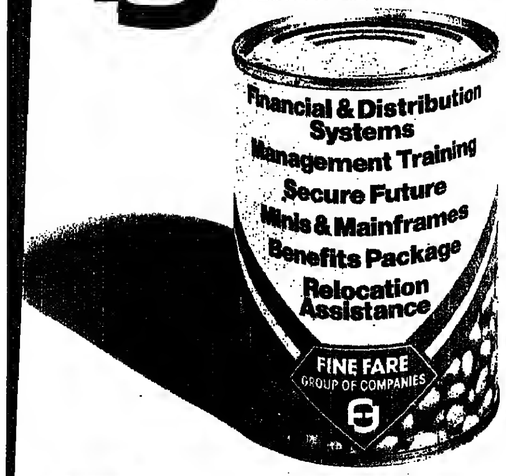
1. Aged 30/40 years with a proven track record in sales and marketing, preferably gained from working for one of the leading UK software houses or bureaux.
2. The ability to lead and motivate a team of professional salesman from the front.
3. The candidate selected will be ambitious and possessing the necessary drive, enthusiasm and determination to meet sales targets and quotas.
4. You will be expected to portray strong technical knowledge associated with a wide range of computer applications and industries.
5. Ideally you will be currently occupying a Sales Management role and seeking a more attractive and challenging opportunity.

If you match the above requirements call us now for initial discussions (24-hour answering service), alternatively write to us as our clients wish to make an early appointment.

(3542)

FINE FARE
WELWYN GARDEN CITY

PROJECT LEADERS
AROUND £10,000 p.a.



Our client is Fine Fare Limited, one of the largest food retailers in the UK. They have depots and supermarkets from Scotland through to the West Country and they control their operations using sophisticated computer systems based on a range of technically advanced hardware.

This is computing at its best, requiring high calibre people to develop and lead major new projects.

They wish to recruit two **senior systems analysts** who are each capable of leading a project team. The technology may be high but commonsense systems are still the order of the day.

One senior analyst will work on head office systems involving financial control and management information. Familiarity with database techniques and a good understanding of project planning and control are required.

The other senior analyst will work on distribution systems which are largely mini-computer based. Previous experience of stock control systems would be advantageous particularly if coupled with remote processing.

The company will pay very competitive salaries and there is a range of big company benefits which includes help with relocation costs in appropriate cases.

For more information on these excellent opportunities contact our client directly: Mike Bradley, Computer Systems Development Manager, Fine Fare Limited, Gate House, Fratherne Road, Welwyn Garden City, Herts. Telephone: Welwyn Garden City 28140 Ext. 121.

CASTLE RECRUITMENT

271 High Street
Berkhamsted, Herts.
Phone: (04427) 74941

Permanent and Contract Staff

Get the Abbey Habit

in London NW1

The Abbey National Building Society continues to be in the forefront in its use of data processing for all its operations.

The Society currently supports a Real-Time System for its extensive branch network which is based on a Univac 1100/81 central computer with Creed 2300 branch terminals.

To further improve its customer service and operational efficiency the Society has recently embarked on a major redevelopment of this system involving the introduction of advanced terminal and telecommunications equipment.

To assist in this major undertaking we are seeking the following data processing professionals:

SYSTEMS ANALYSTS
(Salary from £8000 to £11000 p.a.) and benefits including preferential mortgage terms

This is a unique opportunity to join a young and dynamic Systems Department and progress your career in the areas of Real-Time, advanced terminals and database applications. Ideally you should be a graduate, under 30, and have at least 2 YEARS SYSTEMS ANALYSIS experience preferably in a financial environment.

Any practical experience in the design, development and maintenance of DATABASE Systems would be advantageous.

Essential personal qualities include a sound business acumen, good communicative skills, and above all the drive and stamina necessary to implement projects within tight deadlines.

ASSEMBLER/COBOL PROGRAMMERS
(Salary from £7500 to £9500 p.a.) and benefits including preferential mortgage terms

The successful applicants should have a sound education, be preferably under 30 and possess the character and ambition to progress their career rapidly.

The work is challenging and offers rewarding prospects for those applicants who show the aptitude and flair for involvment in all stages of project development.

At least 2 YEARS APPLICATION PROGRAMMING experience on mainframe or advanced terminal systems is required. Any practical knowledge of structured programming or database techniques would be advantageous.

SOFTWARE PROGRAMMERS
(Salary from £9000 to £11000 p.a.) and benefits including preferential mortgage terms

The successful applicants will have a challenging role at the heart of our Central site developments which will encompass major changes to our communication processing and Real-Time applications.

As such the applicants must be highly self-motivated and should ideally possess at least 2 YEARS UNIVAC ASSEMBLER PROGRAMMING experience and a sound knowledge of UNIVAC Job Control language.

Some practical knowledge of one or more of the following would be advantageous.

1. Communications – CMS; TIP; TELCON
2. Database – DMS 1100; RPS; QLP
3. Operating System – OS1100/EXEC 8

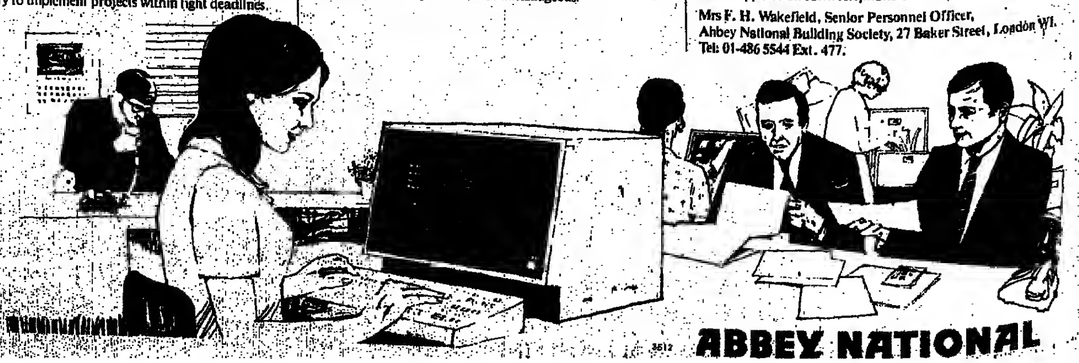
Interested?

In addition to the advantageous mortgage rates, benefits include excellent pension scheme, flexible working hours, subsidised BUPA membership, season ticket loan, 21 days annual leave, social amenities etc.

For further technical information about these jobs please telephone Rob Farbrother, Deputy Systems Manager on 01-486 5555 Ext. 3393.

For an application form telephone or write to:

Mrs F. H. Wakefield, Senior Personnel Officer, Abbey National Building Society, 27 Baker Street, London W1. Tel: 01-486 5544 Ext. 477.



ABBEY NATIONAL

JBA

MIDLANDS AND NORTH

Systems Engineer

East Midlands **£6,500 – £8,500**

This company, a very successful organisation, and at the forefront of its field, wish to recruit a Systems Engineer to be responsible for the support of its manpower resource packages.

Applicants should ideally possess good COBOL and/or low level programming experience gathered on IBM, ICL, HONEYWELL or UNIVAC equipment. Knowledge of payroll, pensions, personnel applications would be a distinct advantage. The ability to communicate at all levels and perform an effective "trouble-shooting" role is essential.

Excellent re-location package and benefits.

Senior Programmer

Gloucestershire **£7,000 – £7,500**

Our client, the market leader in its field and a division of a large and successful international group, have a vacancy for a Senior Programmer.

Candidates should be educated to A Level and possess 2 years COBOL programming experience, preferably on ICL 1900 or 2900 equipment. Knowledge of PLAN and FORTRAN would be useful but not essential. This is an excellent opportunity to work on challenging projects in a purposeful atmosphere. Re-location and large company benefits.

Application Software Sales

London, Scotland, S.W. England earnings £16,000+car

A company whose software applications products have enabled them to establish an enviable reputation throughout the U.K. seek further marketing representatives in the above areas.

Applicants should have D.P. Sales experience but those currently occupying related positions will receive serious consideration. The successful candidates must have the ability to deal with client personnel at all levels and will possess a steady and dependable attitude towards maintaining sales performance. Effective formal training is available as appropriate. Excellent incentives supplement a high basic salary.

Contact: Mike Gaitskell,
JAMES BAKER ASSOCIATES,
International Personnel Consultants,
Gateway House,
50 High Street,
Birmingham B4 7SY.
Tel: 021-643 7865.

3540

THE UNIVERSITY OF MANCHESTER

PROGRAMMER

There is a vacancy in the Department of Computer Science for a Programmer to assist a small research group in the automation (including use of interactive graphics) of printed circuit board design, digital circuit simulation and micro-electronic system design. Experience in the maintenance, documentation and development of computer software is required. Qualifications ONC to HNC or equivalent standard

Salary within the range £4,280–£4,950 p.a.

Applications with full details of age, qualifications and experience should be sent to the Laboratory Superintendent, Department of Computer Science, the University, Oxford Road, Manchester M13 9PL.

[3571]

★DIGICO ASSEMBLER★
★PROGRAMMER★

Contract or Permanent for early start

Three months' assignment with our North London client develops Process Control oriented applications.

Contact Ian Gold on 01-586 0036.

Fraser Williams (London) Ltd.,
38 Warren Street, London W1

Fraser Williams Computer Consultants

LONDON ST ALBANS LIVERPOOL LEEDS MANCHESTER PONTYPOOL BIRMINGHAM BRISTOL SHEFFIELD GLASGOW TORONTO NEW JERSEY

[3082]

ELLESMERE PORT AND NESTON BOROUGH COUNCIL

PROGRAMMER/ANALYST PROGRAMMER

GRADE: AP3/5 – £4,581-£6,381 (pay award pending)

The Council is offering exciting development prospects with plans which include the provision of interactive computing facilities on a number of major systems. The appointee will play a significant role in the development of these systems.

Salary and the duties of the post will be according to experience, preferably in the development of systems having interactive facilities.

The Council operates on ICL 1901T computer running batch programs mainly on financial systems. The purchase of interactive terminal equipment is currently under active consideration on which development of other departments systems is planned.

Temporary accommodation will be considered in appropriate cases.

Details and application forms are obtainable from: S. A. Lucking, Personnel and Management Services Officer, Municipal Offices, 4 Civic Way, Ellesmere Port, South Wirral L65 0BE. Tel: 051-355 3565 Ext. 86. Closing date: 28 November 1980. Canvassing disqualifies.

[3568]

Analyst/Programmers
up to £9720 pa inc.

Two opportunities to work as part of a small team engaged in the appraisal and implementation of computer projects concerned with administrative systems, and the production and maintenance of administrative applications software.

The level of appointment will depend on qualifications and experience, but is likely to involve a number of years' experience of software, systems and programming techniques, preferably with DEC system-10 or other multi-access or microcomputer systems. The ability to communicate effectively and to take a mature approach to management activities is essential.

For an informal discussion about these posts ring 01-368 1256 and ask for Frances Pasco.

Write, quoting ref S103/81048 for further details and an application form, posting first-class to: Personnel Office, Middlesex Polytechnic, Cat Hill, Barnet, Herts EN4 8HT. Closing date 26 November.

[3632]

Middlesex Polytechnic

PROGRAMMER

Rosser and Russell Ltd., a leading building services engineering company is currently upgrading to an IBM System 34.

An experienced RPG2 Programmer is required to join a small DP team and supervise the computer operation whilst implementing and improving systems.

Knowledge of FORTRAN and systems analysis would be useful in this new position which provides excellent scope for career development.

Please write or phone with details of age and experience to Diana Fifield, Group Personnel Manager, Rosser and Russell Ltd., Queen Caroline Street, London W6 9RJ. Tel: 01-748 4181

[3529]

ROSSER & RUSSELL

Recruitment LOGISTIX in Informatics

Datapoint Progs/Analysts
Belgium: Salary to £16K

Our client, one of the leading Total Systems Suppliers in Continental Europe is seeking several Programmers or Programmer/Analysts to join the Company on a permanent basis. Our clients are developing both on-line and distributed processing systems on recently installed Datapoint hardware. The applications involved are in the area of Sales/Purchase Ledger, Stock Control and Parts Inventory, Budget and Trend Forecasting. A proven ability or strong desire to act in both pre-sales and customer support roles is a decided advantage. There is a strong preference for candidates who have current or very recent programming experience in an on-line Datapoint installation. First interviews will be held in our offices after which selected applicants will visit the Company's Head Office.

Ref: L/48/A

Financial Systems
City: Salary to £15K

Our client, a City based Systems Supplier and Software House, has an enviable reputation for its professional services to companies both within "The Square Mile" and the manufacturing process sector. Additional Systems Designers and Project Analysts are sought to join specialist teams involved in a diverse range of projects. Suitable candidates will have at least three years Analysis or Design experience in one or more of the following fields:— Merchant Banking, Foreign Exchange, Portfolio Investment/Management, Life Assurance or Material Requirement Planning and Production Control. All positions will enroll a high degree of client liaison and personal communication skills are therefore essential.

Ref: L/46/B

Telecomms and Networks
W. Germany: Salary to £18K

System X is universally recognised as THE telecommunications system for the '80's and '90's. Such is the high regard for System X that we have been requested to recruit Specialist Software Communications and Networking personnel for development projects in three West German cities. The Company's general specification includes current software development experience with telephony and digital system software. Particular hardware exposure is less relevant than applications knowledge but familiarity with VAX 11/780, Intel 8085/8 or Motorola 6800 will be a distinct advantage. Successful candidates will be well remunerated (even by German standards). Additionally, all Company employees receive Christmas and holiday bonuses. Full relocation expenses will be met. It is useful for social and cultural reasons to speak German although the working language is mainly English.

Ref: L/46/C

Systems Progs/Analysts
Essex/Herts Border: Salary to £11K

Outstanding opportunities have arisen for Systems Programmers and Systems Analysts to work on our client's new IBM 4341 installation on the Hertfordshire/Essex border. As a member of a small team you will assist in setting-up a new department to service various User groups within the company. Projects will range from the design through to the implementation of specific systems for commercial applications including Stock Control, Order Entry and Invoicing. All candidates should have an IBM orientated background and of particular interest will be those who have an extensive knowledge of CICS. It is essential for Systems Programmers to be familiar with the Internals and SYSGEN of DOS/VSE operating system. Our client is keen for all employees to develop their individual careers and efforts are rewarded with an excellent remuneration package.

Ref: L/46/D

Process Control Programmers
Greater London: Salary to £10K

A well established Systems House specialising in the supply of Industrial Process Control Systems requires a number of real-time Programmers to join its Customer Support or Software Development teams. Fluency in Assembler is essential and a knowledge of RTL2, Coral or Fortran will be an advantage. Those applicants who have worked with a manufacturer or have exposure to Kent, Foxboro, or Farranti based systems will be particularly welcome. As the company has a number of overseas offices, candidates who express an interest in relocation to an E.E.C. country will be offered the opportunity to do so.

Ref: L/46/E

Mini/Micro Assembler
Holland and Italy: Pkg. to £15K

One of Britain's leading Systems and Software Houses, with a substantial overseas presence, urgently requires Programmers and Senior Programmers to join existing project teams operating from its Dutch and Italian offices. Whilst the more junior posts are open to those who have been programming in a real-time environment for at least 18 months, applicants for the senior positions will be required to offer a minimum of 3 years programming experience combined with actual or potential managerial skills. Exposure to particular hardware is not a limiting factor but preference will be shown to those familiar with either PDP11 or microprocessor based systems.

Ref: L/46/F

Telephony - S/W Designers
W. Home Counties: Salary to £12K

An established world leader in telecommunications products is seeking Software Designers and Senior Software Designers to join project teams at its recently opened U.K. offices. With a growth record second to none and a planned European wide expansion programme the company is able to offer outstanding career opportunities. At least two years experience in the design and development of specialised software for PBX or PABX systems is essential. Particular hardware experience is not important but familiarity with PDP11 or a leading microprocessor would be advantageous. Candidates able to demonstrate a knowledge of digital hardware concepts will be especially welcome.

Ref: L/46/G

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063 LOGISTIX Telex: 28800

gandalf

DIGITAL COMMUNICATIONS LIMITED

DATA COMMUNICATIONS ENGINEERS

NORTH LONDON - N.W. ENGLAND - SCOTLAND

Gandalf Digital Communications Ltd. is a U.K. manufacturer and supplier of modems, multiplexors and Data exchanges.

Continued success and a rapid growth has created several vacancies in the field service division

Successful applicants will be responsible for installation, sales support and maintenance of the various data communications devices in the above areas

Candidates should be educated to HNC or equivalent standard and be familiar with both analogue and digital electronics. Previous experience in Data Communications would be an advantage.

The Company offers an excellent salary plus quality car, free life insurance, first-class terms and conditions.

Please telephone for an application form or write with details of age, experience and qualifications to:

Mrs. Jean Massey
GANDALF DIGITAL COMMUNICATIONS LTD.
4 Cranford Court
Hardwick Grange, Woolston
WARRINGTON, Cheshire
Tel. Padgate (0925) 817755

(3980)

The AEW Nimrod real-time system.

The most challenging systems project you could ever work on.

There's nothing in the world like the real-time data processing system that's the heart of the Airborne Early Warning Nimrod.

That's fact, not opinion. The system handles all the data from one of the world's most advanced radars, from the aircraft's communication equipment and instruments, and from other sensors. It operates with in the strictest definition of real-time, and to the highest standards of software integrity.

If you're becoming increasingly frustrated with designing and implementing systems that all seem to have much the same applications, come and work on the AEW Nimrod software and its associated proving facilities.

You'll be more familiar with the work than you might imagine – especially if you have a sound background in real-time systems and analysis.

But the one thing you won't be familiar with is the interest and satisfaction of becoming totally involved on a major system with a totally new application.

And on that score, few jobs can compete with these:

Mission Software Team Leader

The team that you will lead will produce mission software to enable air crew in the AEW Nimrod to interrogate the central AEW database and central aircraft subsystems. You will understand the customer's operational and technical requirements and will liaise with hardware and design teams. You have had leadership experience and a knowledge of CORAL 66 and real-time systems.

Mission Software Engineers

You will implement mission software in a team which will provide operator facilities to air crew operating the AEW Nimrod. The software will run in the central computer and interface with both microprocessor based operator consoles and also complex electronic subsystems. You have at least 18 months' relevant experience with high level languages, preferably CORAL 66.

These are positions open only to men and women who have the relevant experience. Posts are also available in other sections for those with equivalent experience and for those employed in related fields who wish to broaden their experience.

Write giving brief details of your experience to C. Hill, Marconi Avionics Limited, Elstree Way, Borehamwood, Herts. Telephone 01-953 2030, extension 3449. Alternatively, telephone 01-207 3455 anytime.

Please quote reference MA80/23.

3647

MARCONI AVIONICS
A GEC-Marconi Electronics Company

THE POLYTECHNIC, HUDDERSFIELD
DIVISION OF COMPUTING AND AUDIO VISUAL SERVICES

An ICL 2880 computer operated under VME/K is used to support the academic and administrative needs of the polytechnic by providing batch and extensive on-line terminal facilities.
Staff are now required to fill the following key posts:

SENIOR PROGRAMMER/ANALYST

APS/901 £8873-£7077 NT 578

An experienced Fortran Programmer is required to develop tailor-made applications programs and to assist in the implementation of packages. We are the implementation site, under the VME/K operating system, for much of the widely used educational software which is distributed nationally including NAG, GHOST 80, OLIM and MINITAB.

COMPUTER TECHNICIAN

T4/8 — £5266-£6351 NT 578

A Technician is required in the Hardware Development Laboratory to assist in the manufacture and maintenance of computing and ancillary equipment. Experience in Digital Electronics is desirable.

COMPUTER SHIFT LEADER

T4 — £6266-£5784 NT 592

SENIOR COMPUTER OPERATORS

SHIFT (2 POSTS)
T3 — £4581-£5139 NT 859

Applicants for these operations posts must have benefited from considerable experience and an ability to accept and discharge responsibility is essential. Currently two shift working is required during term-time for which a 14% allowance is paid.
The salaries listed above are currently under review.
Application forms obtainable from the Personnel Office, Polytechnic, Queensgate, Huddersfield HD1 3UH. Telephone 22288 Ext. 2223. should be returned to that office not later than Friday, November 28th, 1980

Kirklees Metropolitan Council operates a trade union membership agreement and it is a condition of employment that all new employees join one of the appropriate trade unions for their employment group

(3558)

FACILITIES MANAGEMENT BUSINESS SYSTEMS CONTRACT STAFF SUPPORT RECRUITMENT CONSULTANCY SOFTWARE PACKAGES COMPUTER SECURITY RECRUITMENT ADVERTISING FACILITIES MANAGEMENT CONTRACT STAFF SUPPORT RECRUITMENT CONSULTANCY BUSINESS SYSTEMS SOFTWARE PACKAGES

HEXAGON CONTRACT DIVISION

IBM **OS CDBDL PROGRAMMERS**
Several Immediate vacancies exist throughout the southern Home Counties for Programmers with 3 years+experience.

IBM **PL1 + IMS (DB) SEN. PRDG.**
Immediate start for Midlands based 6 month contract.

IBM **PL1 + IMS (DB) PROGRAMMERS**
We need 6 Programmers for a 4/6 month contract in the Midlands. Start December onwards.

IBM **8100 COBOL PROGRAMMERS**
Very well paid 3 month contracts in Home Counties. Immediate start.

IBM **OS CDBDL ANALYST/PROGRAMMER**
We need 2 people to work in the West of England on a 6 month Hardware Conversion Project.

ICL **1900 IDMS SNR. PRDG.**
If you have over 2 years' 1900 IDMS experience, please call for an immediate start in Central London.

WANG **2200 BASIC ANALYST/PROG.**
6 month contract starting within next 4/6 weeks.

IBM **BANKING ANALYST**
6 month contract for General Ledger Project in London Suburb

IBM **JSP CDBOL PROGRAMMERS**
3 or 6 month contracts working on invoicing project in Home Counties.

IBM **DOS (VM + CMS) COBDL ANALYST/PROG.**
12 month contract for maintenance of financial package in Central London.

IBM **COBOL + IMS ANALYST/PROGRAMMER**
January start for 3 month contract in Central London.

IBM **COBOL + DL1 + CICS ANALYST/PROGS.**
Feburary start for 6 month contracts in North London. DOS/VSE will be gained.

PDP 11 **RSX 11M + RTL 11**
If you have design or programming experience, we have 12 month contracts starting Jan. 1981.

12542

HEXAGON computer services
Hexagon House, Wardour Street, London W1V 3HA
☎ 01-439-3871

SYSTEMS SUPPORT EXECUTIVES

£10,000 **2-Litre Car**

Location: South and Midlands

Young, exciting Mini/Micro Systems Manufacturers (major U.S. Parentage) with outstanding products and tremendous growth potential is offering "chance in a life-time" opportunities for top quality DP professionals.
Already highly respected in Europe, they have recently entered the UK stand alone and DDP market with phenomenal success.
Here is a ground floor opportunity to join a highly professional young team.
If you have, or are looking for Sales Support experience.
CALL NOW

(3837)

AB EXECUTIVE
Weybridge (0932) 41321

COMPUTER PROGRAMMER

wanted with minimum of 12 months' experience for Weybridge & Staines. Salary £5,500-£7,000 p.a. (A.A.E.) plus car allowance. Must have one year COBAL or similar commercial language. Please ring John Whitwood NOW on WEYBRIDGE (07) 52937 to make an appointment.

ALDEN (PERSONNEL BUREAU)
26/27 Monument Hill
Weybridge, Surrey
24 hour answerphone service 07 52935

(3838)

D.P. Opportunity
I.B.M. SYSTEM 34

Miele, manufacturers of high-quality domestic appliances, are currently based in West London but are moving to Abington next year. We have the following immediate opening:

OPERATOR

With console experience on System 34. Must be able to work on own initiative, maintain a controlled work flow and service six VDUs.

Salary and benefits are extremely attractive; free transport will be provided from Abingdon to London until the move.

For details please contact:

Mr. F. W. West, DP Manager
MIELE COMPANY LIMITED
Park House, 207/211 The Vale
London W3 7QS
Tel. 01-749 2463

Miele

(3818)

R & D SOFTWARE MANAGER AND PROGRAMMERS

SALARIES IN TOP BRACKET
Plus
OTHER ATTRACTIVE BENEFITS

U.K.'s leading manufacturer of Data Acquisition and Control Systems has the above Senior vacancy and also vacancies for Programmers.

The successful applicants will have a proven track record in Assembly Code and FORTRAN and will be required to develop system software for the Company's range of Data Acquisition and Control Systems. Experience with DEC RT-11/RSX-11M an advantage.

Apply: INTERCOLE SYSTEMS LIMITED
Tel. Chandlers Ford (04215) 4727

(3819)

OCC Computer Personnel (Northern) Ltd
5 Hospital Street Nantwich Cheshire CW5 5RH
Tel. Nantwich (0270) 627 206/24 hours. Telex 367258

europe 81

I have recently returned from visiting a number of our clients in Europe and some of their vacancies are shown below.
These jobs require top quality forward thinking candidates with degrees and solid career records.

The salaries offered will give successful candidates a substantially higher standard of living than they currently enjoy in the UK – living costs in France and Germany are NOT now significantly higher than in the UK. Whilst English is widely used, candidates should be prepared to learn the local language, since this will enhance their career prospects and help them settle into the local communities. Employers usually arrange language training for new employees. / Neville John.

For an informal discussion on any of these positions, please phone Neville John on (0270) 627 206 (day) or (0270) 628 369 (evening and weekend).
Alternatively – complete and post the coupon below – we will be in touch.
Initial interviews will be held in Nantwich or London, and final interviews at client locations soon after.

Brussels Ref. 205

The European data centre of this organisation is based on an IBM 370/158 (MVS, CICS, VSAM) but the hardware will be significantly upgraded in 1981, with the emphasis on the development of on-line systems.

Systems Programmer
CICS, MVS
to BF 950,000

Candidates should have a minimum of 3 years' systems programming experience in MVS or CICS together with good analytical and communication skills and potential for further career development.

Systems Analysts
to BF 950,000

You need at least four years' systems experience ideally including experience of an IBM OS COBOL environment on on-line systems. In addition, good communication skills and a keen interest in business affairs would be helpful.

Hamburg Ref. 201

This multi-national corporation has an IBM 3031 under OS/VS supporting a network of RJE terminals and with local and remote screens running under CICS. There are firm plans to upgrade the hardware and to convert to an MVS environment.

Systems Programmer/ Telecommunications Analyst OS/VSI, CICS
to DM 65,000

Candidates should have thorough experience of systems programming in a TP environment, the ideal being at least three years' exposure to CICS and OS.

Systems Analyst/ Project Leader
to DM 85,000

The Senior Analyst should have several years' experience in analysis, design, programming and implementation of systems, ideally in an IBM installation. Applicants should be able to apply new methods and technology for systems development.

Dortmund Ref. 208

Real Time Specialists
to DM 60,000

Our client, a software house who are well respected and a major force in the German computer industry, is currently keen to expand existing teams working on basic software projects.

Candidates with the most relevant expertise will have three years plus experience in such areas as:
- Compilers
- Operating Systems
- Communications and Computer Networks
- Military Systems

All relocation expenses will be paid as well as assistance in learning German.

Mainz Ref. 203

Senior Analyst Programmer
PL1, ASSEMBLER
to DM 60,000

A major manufacturing organisation with an IBM 370/158 and 4341 is developing a range of systems using PL1, ASSEMBLER, CICS and the packages COPICS and KAPOSS.
Candidates should have a minimum of five years' sound programming and design experience, preferably in a manufacturing environment.

Worms Ref. 206

This data centre has an IBM 370/135 and 4341 running under DOS/VS, and will be converting to twin 4341's in due course. It supports a TP network throughout Europe, which will incorporate IBM 8100's in the near future.

Programmers
to DM 55,000

A minimum of two years' good quality IBM experience on on-line systems is needed. Ideally candidates would have experience of Assembler and CICS, but training would be given to above average candidates with other experience, who can offer potential for promotion to a programming team leader level.

Technical Support
IBM DOS/VS
to DM 55,000

Forward looking candidates with extensive experience of operations and systems software are needed. The small team concentrates on planning, training, development of standards etc and plays a vital role in the implementation of new hardware and systems. Systems programming experience on DOS/VSIs needed.

Epernon Ref. 207

This data centre, near Chartres, based on an IBM 158, is due for upgrade to a 4341 in 1981. It serves a number of locations of a multi-national corporation throughout Europe through its TP network, which will incorporate IBM 8100's in the near future.

Systems Analyst
to Fr 160,000

The analyst will require a minimum of 3-4 years' experience, the analytical and communications skills being more important than the hardware background. Candidates should have the qualities and potential to assume supervisory responsibilities in due course.

Programmers
to Fr 140,000

A minimum of two years' good quality IBM experience on on-line systems is needed. Whilst the ideal candidate would offer Assembler and CICS, training would be given to above average candidates with other experience, who can offer potential for promotion to a programming team leader level.

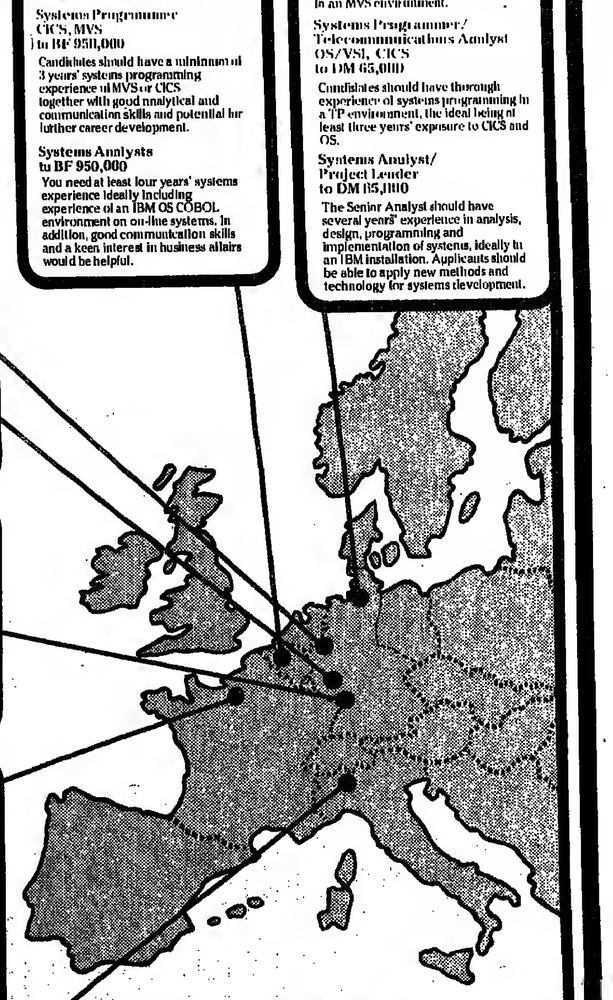
Technical Support
IBM DOS/VS
to Fr 140,000

Forward looking candidates with broad experience of operations and systems software are needed; the small team concentrates on planning, training, development of standards etc and plays a vital role in the implementation of new hardware and systems. Systems programming experience on DOS/VSIs needed.

Milan Ref. 209

Data Processing Manager
to $50,000

An Italian speaking experienced DP Manager is required to take charge of a small DP department, based on a mini computer linked to a mainframe at a distant data centre. There is a staff of about fifteen and candidates will be 28-35 with good managerial experience and the potential to move with the corporation's European development team in due course.



If you are unable to phone – please complete the coupon and send to:– Neville John, OCC Computer Personnel (Northern) Ltd, 5 Hospital Street, Nantwich, Cheshire CW5 5RH.

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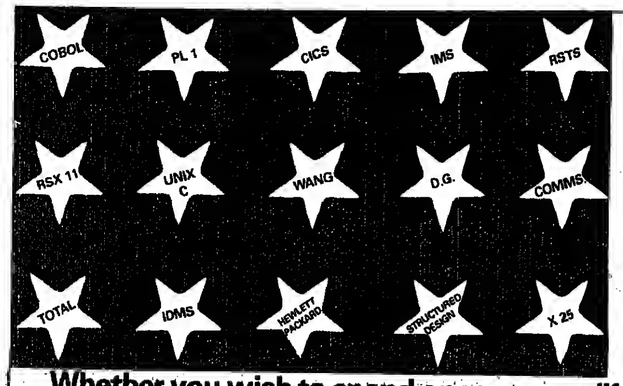
Address _____

_____ Tel. _____

I am interested in _____ Place _____

352



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In these days of financial cuts, it's nice to know there are still some companies whose business is booming, and whose financial commitment to the latest developments in *hardware* and *software* is as strong as ever.

Our client, based in **CROYDON,** is currently upgrading their IBM 370 which runs under DOS/VS and VM to the latest 4300 range. An established user of CICS and Database techniques, they will be introducing IBM 8100 technology to control the interface between word processing and data processing.
The following personnel are required to assist their highly successful team in the development of new projects.

BUSINESS ANALYST – £10K • SYSTEMS DESIGNER – £10K

For more information on these outstanding opportunities ring Diane Williamson

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MANAGEMENT & EXECUTIVE SELECTION

William Key

MIDDLE EAST

[illegible]

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Tax Free £14,000 - £20,000+

Free accommodation + transport + air fares + medical and fees protection, etc.

Our clients are currently recruiting a team of Operations and Technical Support personnel for three projects which are scheduled to commence live running during early 1981.
Excellent tax-free remuneration packages will be offered for single or accompanied status personnel in an area which is very pleasant and trouble free. These will be negotiated on an individual basis with basic fees in excess of £20,000 if this is justified.
Initial contract periods will be for two years.
For all appointments an engineering background or experience in the petrochemical industry would be a distinct advantage. Specific technical training if required will be provided for candidates with equivalent and suitable backgrounds.

PDP 11 RSX 11M ≥ 8086 ≥ VT.100s LA.120s

Operations Supervisor
To be responsible for the hardware in the main control room with a team of three operators. Education to HNC or equivalent and an engineering or petrochemical background would be ideal. PDP 11 experience preferred.

Operators
Engineering or process industry backgrounds. PDP 11 operations experience and HNC or equivalent education preferred.

Programming Support
PDP 11 - RSX 11 experience essential, preferably in both the applications and software areas. Responsibilities will include support, enhancement and development projects.

Field Engineer
A hardware engineer is required to support the main PDP 11 computer and the associated peripheral equipment.

Firmware Support
Intel 8080/86 would be ideal, although similar micro experience will be considered.

Multiple P.851s ≥ Monitor, Data Logging, Control } Equipment

Operations Supervisor
With a team of up to five operators the supervisor will be responsible for all operational activities in this network environment. Experience in an engineering or process type environment is required.

Operators
Operations experience in an engineering environment on Philips or equivalent mini hardware is desirable.

Programming Support
Philips experience would be preferred, although similar experience with suitable training will be considered. Responsibilities will include applications and software support, maintenance and development.

Hardware/Firmware Support
Relevant Philips experience desirable, although appropriate training will be considered. Functions will include maintenance, trouble shooting, diagnostics, installation, etc.

Although start dates for these appointments will be during early 1981 our clients wish to identify and select suitable and interested candidates ideally by the end of November, 1980.

For further information and/or an application form please contact Roger Allington or Jenny Delrymple-Hay on 01-493 2947 (office hours), or Berkhamsted (04427) 2295, or Beaconsfield (04946) 4579 (evenings and weekends) quoting reference No. CW-FL38.

Roger Allington, OCC Computers Ltd., 1 Shrotenway Park, Berkhamsted, Herts.

WILLIAM KEY & PARTNERS, 4 HALF MOON STREET, LONDON, W1

JBA

Software Sales Executive

London Based **c. £20,000 + 2.0 Litre Car**

A leading USA systems software company with over 1,400 installations worldwide are searching for an experienced Sales Executive with management potential.
Operating throughout the UK and possibly Holland the successful applicant will market IBM systems software monitoring and associated packages. As the customer base continues to grow it is expected that you would take over the position of Area Manager inside 12 months.
Applicants must have a strong sales track record possibly in the IBM customer base, have a selection of operations background and be prepared to travel. A degree is preferred and it would be an advantage.
Excellent assurance, BUPA and pension scheme complement a high basic and realistic commission scheme.
Contact: Brian Postles

CICS/COBOL Programmer

Holland **Total Package c. £13,000**

Our client, an established local supplier of fast moving consumer goods, has an immediate requirement for an experienced Programmer to join the permanent staff of their Dutch office.
It is essential that candidates have a minimum of 3 years IBM COBOL experience and be familiar with CICS and DOS/VS. The ability to communicate well with clients is important as is the drive to succeed in this challenging environment.
In addition to an attractive benefits package the Company offers relocation assistance.
Contact: Isobel Bruce

Senior Analyst

London **c. £10 – £12k plus car**

Our client, a leading Computer Systems Consultancy are looking for a Senior Systems Analyst with five years experience in a commercial DP environment and who has spent some time in a programming capacity using a high level language. Although a knowledge of small interactive computers is desirable experience of project management and technical sales support is essential. The successful candidate will be required to discuss in a sales role, at very senior levels, the implications of implementing computer systems, so therefore an awareness of current hardware technology and trends is desirable.
Contact: David Hendry

Project Leader

London **£10,000**

An unusual and highly professional city based financial organisation is looking for an experienced person to play a key role in the expansion of their data processing department. They are installing two PDP 11/70's running under RSTS/E using Basic +2. A Project Leader is now required to take control of a team of analysts and programmers. It is essential to have a minimum of five years in Data Processing, with at least 18 months spent in the capacity of *Project Leader*, with a background of financial and commercial applications. The ability to deal with users is of prime importance. If this experience can be coupled with a knowledge of PDP hardware, this would be a definite advantage.
Contact: Janet Chilvers

DPM – System 34

Surrey **Neg. to £10,000**

JBA has been retained to assist with the recruitment of a Data Processing Manager, for Britax Excelsior, market leaders in the factoring of automotive and motorcycle accessories and a member company of B.S.G. International.
The position will ideally suit a Senior Analyst Programmer who wishes to take a determined step into technical management. It is essential for candidates to have a sound knowledge of RPG2 gained in an IBM small system environment. It is also desirable that applicants have proven experience of commercial business systems development.
The position requires a high level of user contact, therefore the ability to solve problems and to deal with the running of an installation is essential. **Contact: Margaret Stevens**

Support Project Leaders

Herts. **c. £9,000 Package**

Due to internal promotions and steady expansion, our Client wishes to recruit experienced small systems project leaders. Working in the areas of complete turnkey systems, specific software packages and tailor made systems, you will be responsible for assessing Client requirements, designing, amending and implementing the desired packages, and taking charge of post sales support activities for your team.
Essential qualities would be a strong commercial systems analysis and programming background on small business systems, plus the ability to co-ordinate and control a busy team of professionals. Some exposure to micro based systems would be advantageous.
Excellent benefits apply.
Contact: Brian Postles

Reservation Systems Maintenance Manager

South-East **Salary negotiable to Experience**

We have been retained by a leading ferry operator to recruit for them an experienced computer professional to take responsibility for the on-going maintenance and development of a sophisticated real-time reservation system.
The successful candidate will be required to liaise with outside software suppliers and to co-ordinate the activities of user departments.
A strong ICL background coupled with exposure to on-line systems is essential.
This is an unusually demanding role requiring a mature individual with sound administrative capabilities who is able to work under his/her own initiative.
An excellent salary together with concessionary travel completes an attractive package.
Contact: David Hendry

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.

3939

HOLLAND & UK VIA I.A.

Industrial Artists has more challenging and rewarding positions on offer, both on its own staff AND ALSO on the permanent staff of its many clients. A selection from the most urgent of these comprises:

FOR HOLLAND, within the IA team but, based on the client's premises:

4300 SERIES COBOL PROGRAMMER with at least 3 years experience for a DOS/VSE environment using DL/I — applicants having 168/168 experience will be seriously considered.

VM 370 COBOL PRODRAMMER with at least 3 years experience, for an OS environment. Knowledge of CMS/IFS/DMS & VSAM would be of distinct advantage and, any systems programming experience would be useful.

YOUND TECHNICIANS (aged 20 to 25) having a good electronics background preferably to Degree (or close equivalent) standard, to **TRAIN AS INSTRUCTORS** over 1 to 2 years with a manufacturer of mini-computers. Previous computer knowledge and/or experience is not sought in total but, that of **DIGITAL TECHNIQUES** and some of the **SASIC** language will be looked for.

TECHNICAL AUTHORS possessing at least 3 years experience of **HARDWARE ASPECTS OF PRIVATE TELEPHONE EXCHANGES.** Must understand digital techniques and micro-processor applications. Knowledge of dedicated systems & processing principles is desirable. Coverage of manuals to be written is hardware oriented both for total and sub-systems and their installation, maintenance and servicing — and for a new equipment for 50/600 subscribers.

3031 (or 168/168) PL/1 PROGRAMMERS having at least 3 years experience, including IMS and/or TSO, for an OS/(MVS) environment and, preferably, with knowledge of **SOCIAL INSURANCE** and/or **TIME REDISTRATION** applications.

HONEYWELL SULL L64 & L66 ANALYSTS & PRODRAMMERS with a sound knowledge of COBOL, OM4 & IOS/TOS.

SYSTEMS PROGRAMMER with a first-class Assembler background and, preferably, a knowledge of **SIEMENS** BS2000 and CSAM for an immediate (or close to) start.

For the above positions excellent salaries are on offer, including generous concessions negotiated with the Dutch taxation authority, four weeks paid holiday per annum, paid national holidays and certified sick time, a holiday bonus plus the full support of the administrative staff based in our Dutch offices.

MANAGER for SYSTEM DEVELOPMENT DEPARTMENT. Will hold responsibility jointly for total policy and completely for supervision of circa 175 staff engaged in development and maintenance of applicatione programs. Must be a proven manager who, although not a specialist, nevertheless has a reasonable degree of computer knowledge and experience. An academic or equivalent education is looked for and ability to either speak Dutch, or learn quickly, is mandatory. Basic salary package negotiable to Guilder equivalent of £21,000. Here location is Utrecht — and is a 'client permanent staff' position.

IN UK and for our clients' permanent staff:

1 **DEC PDP II/40 PRODRAMMER** with minimum 1 year using BASIC+
Location: Bournemouth Salary: £6000

2 **SYSTEMS PROGRAMMER** with minimum 2 years Assembler. Salary: £9000
SYSTEMS ANALYST having 5 years experience and previous ± 2 years in programming is also held. Knowledge of Life Assurance application will be preferred. Salary: £7/8000
SENIOR OPERATOR with 2/3 years experience, plus the ability to write JCL. Salary: £5/6000
Positions are for a 3031 environment under OS/VS1 with CICS.
Relocation allowances are available, plus subsidised mortgage facilities.
Location: Bournemouth.

3 **SYSTEMS ANALYST/PRODRAMMER** for a **SYSTEM 34** environment, with minimum two years RPD 11. Installation is new and the system has to be set up.
• Possibility of promotion to DP Manager within nine months. Travel to overseas locations may occur.
Location: Maidenhead Salary: £9500-plus bonus.

4 **TWO PROGRAMMING TEAM LEADERS** with minimum 4 years experience. First required for 1903 PLAN-TO-COBOL conversion and second for systems development. Salary: between £7.5/8000 with January review.
SENIOR PRODRAMMER with 2/4 years experience. Salary: £6500 with June review
PRODRAMMER with 1/2 years experience. Salary: £5700
• Hardware 2960 under VME/B and COBOL. Some Fortran knowledge would be advantageous.
• 40 hour week with 8.15am start. Relocation costs available to householders.
Location: Southampton
SENIOR SYSTEM ANALYST with minimum 4 years experience, preferably in manufacturing area. Salary: up to £9,500
SENIOR PROGRAMMER with minimum 3 years COBOL plus good TP.
Salary: up to £7,700
Hardware ICL 2960 under VME/B and DME + minicomputers.
Location: Basingstoke. Relocation allowance possibilities.

6 **TWO SYSTEMS ANALYSTS** — first with project control, DB/TP experience and professional qualifications. Second with expertise to help sell the time-sharing service.
Salaries: between £8/9000 Relocation allowance possibilities.
Hardware Honeywell L66 — with training if required. No programming involved.
Location: Winchester.

7 **TWO SYSTEMS PROGRAMMERS** with minimum 3 years experience. In one case, IBM background required, but Univac training will be given. Salary: £9000 max.
THREE PROGRAMMERS with minimum 2 years COBOL upwards.
Salary range: £7/8000
Hardware Univac 1100/62 with OS 1100 & TIP
Location: Gotwick area

8 **SOFTWARE AUTHOR** with minimum 2 years writing, for commercial business applications (office automation) work. Software engineering background covering either Operating Systems, Compilers, Communications, Business or Laboratory applications is essential. A Programmer, Analyst or Instructor having a proved command of written English could be considered.
Location: Reading Salary: £6/8000 upwards.

SO PLEASE WRITE OR TELEPHONE NOW:
Ann Arlidge,
Marketing and Recruitment Director,
Industrial Artists Limited
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Herts SG5 1JW.
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IBM OS PL/1	**Programmer**	***Hampshire***
IBM COBDL, CICS DOS VSE	**Analyst/Programmer**	***London***
IBM, DS, CICS, IDMS	**Systems Programmer**	***London***
IBM, OS MVS VTAM CICS	**Systems Programmer**	***London***
IBM PL/1 MACRO CICS DDS	**Programmer**	***London***
IBM SYSTEM 38 RPGIII CCP	**Programmer**	***London***
ICL 1900 IDMS	**Programmer**	***London***
PDP 11 BASIC + RSTS	**Programmer**	***London***

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We want the opportunity to discuss a future with our Clients, an American market leader in stand-alone and shared resource Word Processing Systems.

They are prepared to 'front' a good income with excellent potential to earn substantially more selling a comprehensive range of first-class W.P. Systems.

PLEASE DO NOT APPLY TO THESE POSITIONS IF YOU DO NOT IDENTIFY COMPLETELY WITH OUR REQUIREMENTS. OUR CLIENTS WILL NOT DROP THEIR STANDARDS UNDER ANY CIRCUMSTANCES.

Contact **BOB BOWER, Advising Director, quoting reference CW1311/1.**

(3606)

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SENIOR PROGRAMMER
CIRCA £10,000 P.A.

ANALYST PROGRAMMER
CIRCA £10,000 P.A.

Our Clients are a large international bank whose European headquarters are in London. Here, teams develop and maintain the Bank's computer systems based on DEC 11/70's and 11/50's.

The language used is AIMS and experience in this would be ideal. Alternatively, applicants should have good experience in BASIC PLUS or COBOL and be prepared to learn AIMS. Although not essential, experience in a commercial banking environment would be preferable, particularly for the Analyst Programmer position.

Please contact the Advising Director, BOB BOWER to arrange an interview. Ref: CW1311/2.

(3568)

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CHESHIRE PROJECTS CONTROLLER

DEFENCE c. £15,000

An interesting opportunity has arisen for a Projects Controller to assume responsibility for all aspects of defence contracts for a well-known systems house.

Reporting to the Production Director, you will be responsible for the control and monitoring of several projects, including project resourcing, customer liaison on contracts and evaluation of bid prospects.

We expect you to have at least 10 years' Real-Time experience of high integrity, high availability systems in defence environment. This should include:

★ Knowledge of command and control, communications and retrieval systems.

★ An understanding of defence study methodologies and familiarity with defence standards and controls.

★ Defence project management experience.

For further information please contact MARK IRENS, quoting reference CW1311/3.

(3566)

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SOFTWARE TEAM LEADER

PDP11/44's, VAX, INTEL 8086's, CORAL, MASCOT, ADA

REAL-TIME SYSTEMS

£8,000-£10,500 **LONDON**

A leading systems house is now entering the development phase of one of the most complex military command and control systems ever conceived.

This software team leader will lead a team of about five Programmer/Analysts in this area of TERMINALS and PERIPHERALS specifically the design and building of the man-machine interface software to integrate peripherals, such as super-intelligent VDU's, hand-held devices and graphic VDU's and plotters, into the very large and complex multi-micro Real-Time System.

This is an opportunity which should appeal if you are looking for your first leadership role and have the following background:

★ At least 2 years' experience of implementation of Real-Time Systems on minis and micros, preferably in a military environment.

★ Knowledge of peripherals, hardware and software.

★ CORAL or MASCOT experience.

★ A good degree in computer science, electronic engineering or similar.

For further information please contact MARK IRENS, quoting reference CW1311/4.

(3566)

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Selling our brand new PTS-2000 terminal system, you'll have a strong promotional package to rely on, and much more.

The PTS-2000 has several features which make it a unique terminal system. For a start, it's plug compatible with the new IBM 3274/76. And, as the industry's most advanced interactive system, considerably more cost-effective than existing equivalents. We can also deliver the PTS-2000 almost as fast as you can sell it.

From your point of view that means you'll be selling the best product on the market, one with enormous potential for the next decade. With a basic salary of £8,500 plus a car, you'll be earning around £17,000 for on-target performance, and we operate an open-ended bonus scheme.

At the moment we need three sales professionals with successful DP sales records — two to cover the London area, another the South West of England. You should preferably have been in terminal selling, but any DP experience is acceptable. Technical knowledge is not as important as proven sales expertise. And you should have the confidence — and ambition — to progress eventually to sales management. As a major force in both hardware and software markets we can offer particularly good career prospects within our own organisation and beyond in the Raytheon Group.

Either write with full details or phone for an application form to:
Ann Fortescue,
Recruitment Officer,
Data Logic Limited,
29 Marylebone Road,
London NW1.
Tel: 01-486 7288.

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3541

McDERMOTT INC.

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(Division of McDermott International, Inc)

ANALYST/ PROGRAMMER

McDermott Scotland, world leaders in the fabrication of Offshore Oil Production Platforms and related structures, have a vacancy for an Analyst/Programmer at their Ardersier Fabrication Yard, located 15 miles from Inverness.

Our present installation comprises an IBM 370/125 (DOS/VS, POWER/VS and VSAM) with a TP link to IBM 4341 in Brussels.

CICS/VS has been installed and various engineering and commercial applications are under development.

Applicants should be educated to at least 'A' level standard with a minimum of 2 years' experience ideally in a DOS/VS environment similar to the above. Additional experience in structured programming and tele-processing techniques would be advantageous.

Successful applicants would initially join our development team as Programmers, but would be encouraged to develop analytical skills and to accept additional responsibilities within the team.

The terms and conditions of employment are excellent and a generous relocation package is available. For further information and an application form, please write giving career details to:

Personnel Department
McDermott Scotland
P.O. Box 5
INVERNESS IV1 5UP

(3572)

RPG II (CCP) PROGRAMMER

London £6,500-£7,500

We require an experienced **RPG II** programmer for our **IBM SYSTEM 3/15C.** Knowledge of CCP would be an advantage.
Please contact:
Leslie Dasser, DP Manager, J.I.A.
741 High Road, N12
Tel: 01-446 1477

(3576)

PROGRAMMERS

London IBM Cobol/PL1/Mark IV

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SDA
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U-C-A

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London and Home Counties To £9,000 + Car

We have six MINI computer manufacturing companies with offices around the country who require people with the confidence to deal with clients in a pre- and post-sales situation. All vacancies require a programming background on minis and the jobs will provide an exciting and satisfying career. IBM or other main frame experience is also an advantage. CW46/1 Michael.

Lots of PL/1 Vacancies

London and Home Counties £5,500 to £11,000

We have a number of positions ranging from Programmer to Project Leader with both small and large commercial companies. Locations are the CITY, BROMLEY, BRENTFORD, REDHILL, SLOUGH, SOUTHALL, COCKFOSTERS, WATFORD, BEDFORD, ESHER, CRAWLEY AND MID-KENT. CW46/2 Michael.

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IBM	4331 COBOL CICS DOS	LONDON	3 mths.
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IBM	4331 COBOL DOS	HANTS	3 mths.
H'WELL	L66 IDS TDS COBOL	HANTS	3 mths.
H'WELL	FORTRAN IV	GERMANY	1 yr.
IBM	SYS PROG IMS/MVS	SWEDEN	6 mths.
			3 mths.

Phone Irene for details CW46/3

CM IBM Support Programmer

Hampton to £11,000

A very major IBM Service Bureau, part of a multi-national organisation, is looking for a presentable, verbal professional able to conduct sales courses and demonstrations to clients. Past experience should include COBOL, FORTRAN or PL1, under OS with JCL knowledge would be an added advantage.

Absolutely super perks and prospects look excellent. CW 46/4 Michael.

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CONTRACTS FOR PROGRAMMERS

IBM SYSTEMS 34 PRG11	CROYDON	£15-£17,000
DEC PDP DIBOL	CROYDON	£15-£17,000

These are just a few of our current vacancies.

For further details please contact:
CHRIS TILLBROOK

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Field Engineer with management potential to operate around Leicester. Rapidly expanding U.S. Company setting up U.K. Field Operation, req. first Midlands Eng. min. 2 years Mini + peripheral exp. Sal. c. £8.7k + O/T + car.
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Software Engineer required to work on design and development of marine training simulator. Knowledge of digital equipment computers, RT11 and Macro essential. Some travel in UK and abroad possible. Salary negotiable, dependent on experience. Good company benefits. A chance to join a young growing company with worldwide interests.

Contact: Mr. M. Jones
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SOUTH WALES CONSTABULARY

FORCE TECHNICAL COMPUTER OFFICER

£8,328 to £9,330
(Pay award pending)

The South Wales Constabulary are seeking an experienced computer professional to fill the new post of Force Technical Computer Officer at Police Headquarters, Bridgend.

The Force Technical Computer Officer will assume technical control of a computer-based Command and Control system utilising a dual processor system supporting sixty Visual Display Units and forty printers, for which a contract is about to be awarded. He/she will be expected to liaise with police officers at all levels and give technical advice on problems arising with the operation of all the computer equipment associated with the South Wales Constabulary.

Applicants should have a relevant degree or professional qualification and considerable experience of the design and programming of dedicated real time systems using mini computer hardware.

The position is suitable for a person currently in a senior technical support position seeking wider managerial and technical responsibility.

Write or telephone for an application form to The Chief Constable, South Wales Constabulary (Computer Project), Police Headquarters, Bridgend, CF31 3SR. Telephone 0656-55555 (extension 361/362).

Closing date for applications Monday, 24th November, 1980. (3578)

Computer Technician— T2

A new post in our Computer Centre for maintenance of terminal and peripheral equipment of all kinds, clearing faults wherever possible etc.

Salary: T2 £3,990 to £4,476.

For further details contact:
'Personnel'
Tha Polytechnic Wolvarhampton
Tha Molineux, Molineux Street
Wolvarhampton, WV1 1SB
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3683

CITY

Our client, a leading service organisation with some of the most up-to-date techniques in technical research and development, are seeking the following staff. The Company operates worldwide and uses an IBM 3033-N8 computer.

TECHNICAL

JUNIOR TECHNICAL PROGRAMMER — To £6,500

For this position, you must have a degree in either Engineering, Maths, Computer Science or other scientific subject. Applicants must have 6 to 12 months' experience in some or all of the following: IBM 360/370 — Hewlett Packard 9830/45 BASIC — FORTRAN — JCL — TSO

TECHNICAL PROGRAMMER — To £8,000

A graduate is required again with the above specifications but applicants will need to have 1-2 years' experience of Engineering applications.

COMMERCIAL

Prospects within the Company are excellent for people with drive, enthusiasm and initiative. These vacancies have arisen due to the need for new systems development.

PROJECT LEADER — To £11,500

Applicants must have at least five years' systems analysis experience covering medium to large systems from feasibility through to implementation. Experience of managing or leading a project team is vital.

SENIOR SYSTEMS ANALYST — To £10,500

At least four years' experience as a Systems Analyst is required for this position, including experience of developing and implementing large systems. Experience of database techniques and terminals an asset.

SYSTEMS ANALYST — To £9,500

Only two years' systems analysis experience is required, including some involvement in medium to large systems.

If you are interested in applying for the above positions, please send us your FULL C.V. or phone for an Application Form.

AMES PERSONNEL
Employment Agency Suite 14 Oxford Chambers
119 Oxford Street, London W1R 1PA Tel 01 434 1106
(3538)

We are offering Peanuts

(and a bottle of beer/glass of wine)

For Analysts & Programmers

TUESDAY 18 ★ WEDNESDAY, 19 NOVEMBER
Civic Centre, Station Road, Harrow

So why not come along and have an informal chat with us over drinks & snacks on TUESDAY 18 & WEDNESDAY 19 NOVEMBER from 4 to 9 p.m. We are holding open evenings of our offices in the modern **Civic Centre in Station Road, Harrow,** one minute from Harrow & Wealdstone Station. If you can't make it, call our Computer Manager, Gerald McDonough on 01-863 5611 and he'll arrange a more convenient time. Either way we could have a lot to talk about. If you prefer, written applications should be sent to Gerald McDonough, PO Box 21, Civic Centre, Harrow, Middlesex.

At the London Borough of Harrow we've expanded our computer function. The IBM 4341 has just been installed and is operating under VM and DOS/VSE, providing both batch and on-line service, and teleprocessing is under the control of SHADOW II. We'll also be using both database and teleprocessing techniques.

This is all part of a newly organised structure, created to develop and install new projects. Our applications include Libraries, Forward Planning, the Area Health Authority, the Electoral Roll, the Engineering & Architects departments as well as Financial applications. To carry through this ambitious plan we need first-class and experienced men and women.

Systems Analyst — up to £10,500
Liaising directly with our user departments and defining their requirements, you'll also be responsible for design, implementation and maintenance of systems.

Lead Programmer — up to £10,500
You must be an experienced COBOL Programmer, capable of leading and motivating a team of application programmers, and controlling quality and progress of work.

Analyst/Programmer — up to £9,600
An experienced COBOL Programmer, you should also have a working knowledge of Systems design.

Systems Programmer — up to £9,200
An experienced Systems Programmer, you should be able to evaluate and implement new software, acting in a technical support role to both users and development personnel. IBM experience required, preferably with VM and DOS/VS knowledge.

We can offer many benefits and advantages:
Flexible working hours, relocation package which includes legal and estate agent's fees for suitable applicants, 25 days' holiday, season ticket loans; pension scheme; sick pay, etc. Pleasant modern offices with subsidised restaurant and our staff club. Easy access by public transport and ample parking space. Shops, restaurants and a superb leisure centre within a few minutes' walk. And excellent prospects for both job satisfaction and career development.

Don't Monkey about, See you on Tuesday or Wednesday

Harrow

ANALYST/PROGRAMMERS

London IBM Cobol/PL1/Mark IV

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SDA
(2123)

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THE SALES BIT

How to make time your most valuable asset

TIME is the salesman's most valuable asset. His greatest responsibility is to utilise it in the most effective manner.

This demands considerable thought, dedication, and above all efficient planning. Whatever objectives a salesman may have, the route to success can be described in elements of time.

The effective use of this time is dependent on attitude, habit and possibility horizons.

Take, for instance, planning to achieve sales target at the beginning of a new target year. The route to achieving total sales quota can be expressed in terms of an approximate number of orders, based on the typical value of an individual sale.

Using the experience of the previous sales year, these can be described as a proportion of the required number of prospects available for conversion, which in turn can be derived from a much larger quantity of suspects which emanate from initial pioneering work.

Awareness

These possible sources of business are then a function of the number of calls which can feasibly be made in a working day, and this is clearly derived from the amount of time available.

The effective use of the salesman's working day is a function of many factors: journey planning; scheduling of appointments; controlling the duration of sales call and so on. However, above all it is dependent on having a real awareness of the amount of time actually available for selling.

For instance, many salesmen believe that selling cannot generally be conducted on Monday mornings, Friday afternoons, before 10am or after 4.30 pm and between the hours of noon and 2.30 pm; the notable exception being the occasional lunchtime appointment which can often be related more to self indulgence than selling.

The very fact that this belief is so widespread makes these apparently unavailable hours of business particularly fruitful to the more objective salesmen.

First

It also makes me wonder whether the typical lack of face-to-face sales activity at the beginning and end of the week is more a function of inadequate salesmen than reluctant buyers.

The most important call is the first call of the day, for it tends to dictate the pattern of subsequent sales activity.

A familiar and extremely negative approach to planning sales calls is to assume that everyone has masses of post to process every day which excludes all other events until it is cleared.

Another negative assumption, particularly in London, is that most people do not reach their offices until after 9.30 am.

The answer is quite simple: Always try to make the first appointment each day for 8.30 am. You will soon discover, and therefore be able to note, which people are usually around at that time.

You will be surprised how many bosses normally arrive at work before 8.30 am, or are willing to come in a little earlier to see you. Most organisations do not finish distributing their mail until well after 9.30 am which gives plenty of time for discussion before the postal ritual.

Determined

Appointments after 4.30 pm are typically more difficult to arrange than in the early morning, but nevertheless many bosses are prepared to stay until 6 pm and beyond if they believe they can discuss a product which might be beneficial to their company, particularly with someone who is also prepared to give up a little of his own time.

As for lunchtime, the determined and well organised salesman can often work right through the lunch period if need be. This ability is purely a function of keeping effective client records.

There are two fairly consistent features of lunch periods. They normally last for one hour and typically begin any time between noon and 1.30 pm, so many people have returned from lunch before others have started. The question is who lunches when, and that is where detailed client records are essential.

Most salesmen within the computer industry could significantly increase their existing call rate by utilising their selling time more effectively, with obvious rewards in terms of sales achievements.

Of course there are many disciplines and techniques which can improve sales efficiency, but none can bring more significant results than simply getting to the first call by 9 am at the latest every day, knowing which clients lunch when and having an open mind about proper and improper times to call.

TRADER

COURSES

A SERIES of computer training courses is being held by LBMS in December. From December 8-12, a course entitled Database Development Workshop will be held in Bournemouth. It is aimed at DP staff working on database development projects. The fee is £375 + VAT. Between December 15-17, an introduction to computer systems, data processing and system development methods, will be held in London. Called User Involvement in Computing, the fee is £190 + VAT. For further information about these and other courses, ring the registrar on 01-637 9699.

A COURSE entitled The Electronic Office is being run by The Institute of Chartered Accountants of Scotland. Information will be given on the use of new technology in the office, including word processors, microcomputers and viewdata. The course will be held between 9.30 and 5.00 on November 25 at the Albany Hotel, Bothwell Street, Glasgow. The fee is £40.25, including VAT. Further information from the director of post-qualifying education, the Institute of Chartered Accountants of Scotland, 27 Queen Street, Edinburgh EH2 1LA.

Puzzle Answer

ALL such areas are exactly divisible by 6, so 680 is the number that was added.

ANALYST/ PROGRAMMER

Hampshire c.£7,500

Interested in using your practical computer knowledge in a way which can have a major influence upon change in a large and successful company? If so read on.

We are a major milk processing/distribution company which has recently made a major capital investment in Hewlett Packard computers. We are looking for an Analyst/Programmer to join one of our companies, Home Counties Dairies based at Aldershot.

Apart from your computing skills, we are looking for candidates interested in career progression and who possess innovative skills and the ability to effectively communicate ideas.

We offer the usual large company remuneration package, including relocation expenses where appropriate.

Applications to:

Bernard LeBargy, Staff Manager
Unigate Dairies Ltd
PO Box 782, Western Avenue,
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Tel: 01-992 3400

(3587)

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City of Coventry
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Principal: Dr. H. E. Avery

LECTURING IN COMPUTING/DATA PROCESSING

You may not have thought of a move into education but it's well worth considering now. This could be the stage in your career when you're looking for a fresh challenge. Computing in further education is a developing subject in an expanding field and offers sound career potential.

At Tile Hill College of Further Education we are looking for a Lecturer I in Computing for our Business and General Studies Department to commence as soon as possible.

The man or woman we are looking for will be required to teach data processing and computing to students following Business Studies courses.

Applicants should have relevant industrial/commercial experience and be suitably educationally qualified.

You'll be working in a large, modern college with excellent working and recreational facilities situated in a pleasant part of Coventry.

Salary up to £8,595 per annum.

Further particulars and application forms obtainable from the Principal, Tile Hill College of Further Education, Tile Hill Lane, Coventry CV4 9SU. (3578)

NATIONAL INSTITUTE FOR RESEARCH IN DAIRYING

COMPUTER RECORDS OFFICER

A vacancy exists in the Dairy Husbandry department for a person with experience in computer programming to take daily charge of the departmental Records Office. The Records Office staff collect, check and process the data (milk yield; health, reproduction, liveweight, stock numbers) derived from the Institute dairy units. The person appointed should have experience in computer programming (Fortran). He/she will maintain existing recording schemes and computer programs and develop further programs to meet various research and farm management requirements. A knowledge of agriculture would be an advantage but is not essential.

The post provides excellent experience in the developing field of the use of computers in agriculture.

Qualifications: Degree in scientific subject or HNC with relevant experience.

Appointment will be as Scientific Officer (£4809-£6480) or Higher Scientific Officer (£6075-£7999) according to qualifications and experience. At least five years' appropriate post-qualifying experience is required for appointment at Higher Scientific Officer. Non-contributory superannuation.

Application forms are obtainable from the Secretary, NIRD, Shinfield, Reading RG2 9AT.

Quote reference 80/4. (3551)

POLYTECHNIC OF THE SOUTH BANK
Borough Rd., London, SE1 0AA

Department of Mathematical Sciences and Computing

LECTURERS II (TEMPORARY) in COMPUTER SCIENCE AND (Ref. X.8) DATA PROCESSING (Ref. X.9)

Required for session 1980/81 only to teach on a range of undergraduate diploma and professional courses in Computing.

For the Computer Science post, applicants should offer specialism in one of the following subjects:

Programming Theory & Methodology
Systems Programming
Programming in Structured Languages

For the Processing post, they should offer Data Processing and Systems Analysis or Commercial Programming.

Salary (subject to formal approval) £6,771-£10,451 (inclusive of Inner London Allowance).

Further particulars and application form from: The Staffing Office, Polytechnic of the South Bank, Borough Road, London, SE1 0AA. (3576)

HOLLAND GERMANY

Macro 11 (under RSX-11M), DG, Intel, TI Assembler or similar and Fortran required for European projects currently operated by UK Systems House. Excellent UK salary plus substantial overseas allowances.

£15-19K

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IBM and CIIHB mainframe Programmers, Sys Programmers and Analysts required by Paris-based organisation: experience to include either COBOL, PL/1 or Assembler (min. 3 years). DB/DC techniques or operating systems knowledge.

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TELEPHONE SYSTEMS

Top-level Systems Engineers (10+ years' exp.), sought by company in S. Germany for real-time telephone control systems currently being designed. Permanent positions or 2-3 yr. contracts offered.

c £20K

CONTROL SYSTEMS

Micro Systems design experts needed to work on measurement, control and automation systems at advanced technology centre in Kent. Electronic Engineering or similar background an advantage, combined with at least 5 years' solid micro experience.

to £11K

MIDDX - COBOL

Programmers, Analysts and Team Leaders with COBOL experience and, ideally, some knowledge of structured programming techniques, required to meet expansion plans for development centre of leading manufacturer. Degree preferred, no specific h/w background but commercial/financial applications experience necessary.

to £12K

2900 VME/B

Analyst/Programmers and Analysts, COBOL programming background, required for new project being undertaken by Systems House in Central London. 2 or more years' experience in large ICL 2900's under VME/B required.

to £12K

DB/DC EUROPE

Analyst/Programmers and Designers, with in-depth experience of IMS, DL/1, TOTAL, CICS or similar DB/DC experience (technical not managerial) urgently sought by European offices of Intnl. Systems House for development work.

to £16K

MESSAGE SWITCHING

Analysts and Programmers with Assembler, Coral, RTL 2 or Basic experience plus 2 or more years' in the message switching field, needed urgently for UK and European projects operated by Systems House.

UK to £11K
EEC to £17K

MACRO II

Programmers and Analyst/Programmers with 2+ years' Macro II wanted to join young but rapidly growing Software House. Projects are technical, scientific and military, so knowledge of CORAL, Fortran, etc., is an additional advantage. Offices in London projects in diverse locations.

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MICROS - HERTS.

Assembler and Basic programming experience in Micros or small Minis urgently required by Manufacturer of Intelligent terminals in Herts. 18 months-plus experience necessary to be involved in interesting development work with excellent prospects as the company is small but rapidly expanding.

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01-373 3063
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Systems Programmer
Merseyside

The Natural Environment Research Council has a vacancy in its Computing Service for a Systems Programmer based at the Institute of Oceanographic Sciences, Bidston.

The successful candidate will take charge of the maintenance and updating of systems software, including GCOS and GRTS on a Honeywell 66/60. Experience in a similar Honeywell system is desirable but we are willing to consider candidates, with experience in any mainframe system software, for training.

The post will be graded at Higher Scientific Officer/Senior Scientific Officer level. Applicants should have a degree or equivalent qualification with at least two years relevant post-graduate experience. Starting salary depending on age, qualifications and experience will be in the range:

Higher Scientific Officer: £6,075 – £7,999
Senior Scientific Officer: £7,644 – £9,619

NERC is not a Government Department but conditions of service are similar to those of the Civil Service. Benefits include 22 days holiday and a non-contributory pension scheme.

Application forms and further information are available from: Mrs. P. Judson, Natural Environment Research Council, Polaris House, North Star Avenue, Swindon, Wilts SN2 1EU.
Telephone Swindon (0793) 40101 Ext. 432
Please quote ref: 088.
Closing date: 4th December 1980.

Natural Environment Research Council (3573)

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Basic salary £8,000 plus overtime plus car plus training. If you are ambitious, feel capable of assuming responsibility, why not take that all-important step forward — if living in London or Home Counties, call us today, but hurry ...
Ref. EK2014.

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Presently our typical Computer Systems consist of several large dual Sigma 9 mainframes with Ampex 512K, 32 bit word memories and Honeywell 4, 096 K, 32 bit word memories, Memorex disc drives, STC 6250 bpi tape drives and Data Products printers.

We are currently looking for:

TRAINEE COMPUTER ENGINEERS AND A REPAIR TECHNICIAN

Engineers should have electronic knowledge and preferably some computer mainframe and peripheral experience.

A Repair Technician should also have electronic experience and be capable of fixing computer modules and power supplies as well as assisting with stores and spares.

We will provide Engineers with training where applicable, following which successful persons will become members of the engineering team which is involved in installing, commissioning, upgrading and maintaining our systems.

TELECOMMUNICATIONS ENGINEERS

Applicants should be highly motivated with HNC or equivalent in Electronic Engineering and a minimum of two years solid experience in a data communications environment.

You will join a team of professional engineers with full responsibility for the 24 hour operation of the existing data communications network. Activities will include installation and maintenance of network hardware such as mini-computers, multiplexors and modems. Ability to fault-find to component level is essential.

These new opportunities offer career advancements to men or women in a fast moving environment, where exciting plans are shaping for further expansion into Europe.

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For Computer Engineers and Repair Technicians, contact Pete Mills. For Telecommunications Engineers, contact Ray Miles, both on 01-351 4399. Or write to them at Comshare Limited, P.O. Box 197, London SW3 5RL.

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OFFICES IN LONDON ABERDEEN BIRMINGHAM BELFAST BRISTOL CARDIFF EDINBURGH GLASGOW HEMEL HEMPSTEAD LEICESTER MANCHESTER SHEFFIELD WAKEFIELD WARRINGTON WASHINGTON WINCHESTER BELGIUM FRANCE GERMANY HOLLAND CANADA UNITED STATES JAPAN (3570)

Senior operators

Metropolitan Police Office

The Metropolitan Police Office has vacancies in their Central London and Putney Computer Centres for experienced staff to operate and provide support services to their computers. The post also involves the supervision and training of junior staff.

Pay: £4,426 per annum on entry rising by annual increments to £5,212 plus an inner London Weighting allowance of £1,016 per annum. A shift allowance of 20% or 12½% is payable depending on the actual shift worked. Opportunities to work overtime, premium payments it weekends worked.

Experience: 2 years operating
Hours: 41 hours per week
Holidays: 4 weeks plus 10½ days public and privilege holidays per year.

For further information please ring 01-230 3948.

(3586)

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Stamford Street
London SE1 9LU

DOS SYSTEMS PROGRAMMER

New Cross/Lewisham c. £10,000 + Bonus

The company designs and manufactures precision machinery and is a world leader in its field. A sophisticated DP user, they have used computers since the 60's and have recently replaced an IBM 370/138 by a 4 megabyte 4341, 3350 discs, under DOS/VSE with 20 local and remote screens. VM/CMS and the DL/1 database are planned for the future. One of the company's divisions also has a large DEC PDP 11/70 installed and there are TP links between sites.

This is a technically advanced installation, with ultimate plans for establishing an SNA network including 4341 and 4331's. It offers you:-

- A start salary of c. £10,000
- Good career opportunities
- 5 weeks holidays
- Challenging and interesting work

Ideally you should have in depth DOS systems programming, or related experience, OS experience would be considered. For more details or to arrange a meeting (outside office hours if required), please write or telephone quoting reference: CW 161-T.

3641

CAPP ASSOCIATES 01-686 9693
Computer and Professional Personnel Consultants
AMP House, Dingwall Road,
CROYDON CR9 9XA

Lecturer I in Computing

required to teach on a range of courses including those leading to BEC/TEC National Awards in Computer Studies and to "O" and "A" level in Computer Science.

The person appointed would also be concerned with the NCC Threshold Course and may be involved in teaching computing to BEC and TEC students where this subject appears as part of their course. Commercial or industrial computing experience is essential for this post. Salary is on a scale up to £8055, the starting point depending on experience and qualifications.

Application forms and further particulars may be obtained from the Principal, to whom completed applications should be returned as soon as possible.

OXFORD COLLEGE OF FURTHER EDUCATION (3590)
Oxpens Road, Oxford, OX1 1SA tel: Oxford (STD 0865) 45871

THE OPEN UNIVERSITY
Computing Service

PROGRAMMER/ANALYST

The Service provides practical computing facilities to students through a nationwide time-sharing network of DEC-system 20 computer systems as well as a computing service to staff and full-time research students of the University.

A vacancy exists for an experienced Programmer/Analyst with a sound technical computing background to join its Systems and Programming Group. The work of the Group embraces developments in the areas of course production, student support, institutional research and computer based research and development projects. Initially the successful applicant will work on the further development of Optel, a computer based information retrieval system along the lines of Prestel.

An appointment will be made within the scale £5,505-£9,595 (under review), plus membership of the Universities Superannuation Scheme. The University offers attractive working conditions including six weeks' annual leave plus assistance with relocation to the Milton Keynes area.

Application forms and further particulars are available from The Administrative Assistant (3599/2), SCS, The Open University, Walton Hall, Milton Keynes MK7 6AA (telephone 0908 653933; there is a 24-hour answering service on 653935). Closing date for applications is 5th December, 1980.

(3597)

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Right now, our clients are looking for the following people to join their highly successful operation which provides specialist DP and management services to a major international consumer products group.

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To head up an experienced technical team developing one of our many new computer systems.

Analyst/Programmers

Professionals who can establish effective user relationships and support for our batch and timesharing systems.

Our clients hardware includes an IBM 3031 and a 370/158 running OS/VS1, VM and DOS/VS. On-line processing is based on a CICS teleprocessing network and distributed systems development is a key feature of the short term strategy.

In terms of personal rewards, you'll find this offer hard to beat. Salaries will be between £10-£12,000 p.a. together with a valuable range of fringe benefits. There are varied opportunities for career development, all of which offer first class progression.

If you are a young, determined professional, preferably a graduate with ideally 3-5 years experience, you should find out more about these exciting opportunities.

For more information, telephone in complete confidence to: R. Wareham on (01) 631 4411. If you prefer, write with brief details of your experience to him at Moxon, Dolphin & Kerby Ltd., 178-202 Great Portland Street, London, W1N 5TB, quoting ref: RW/734/CW.

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(3644)

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Romford, Essex
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(3649)